

**AR32**

# BORG

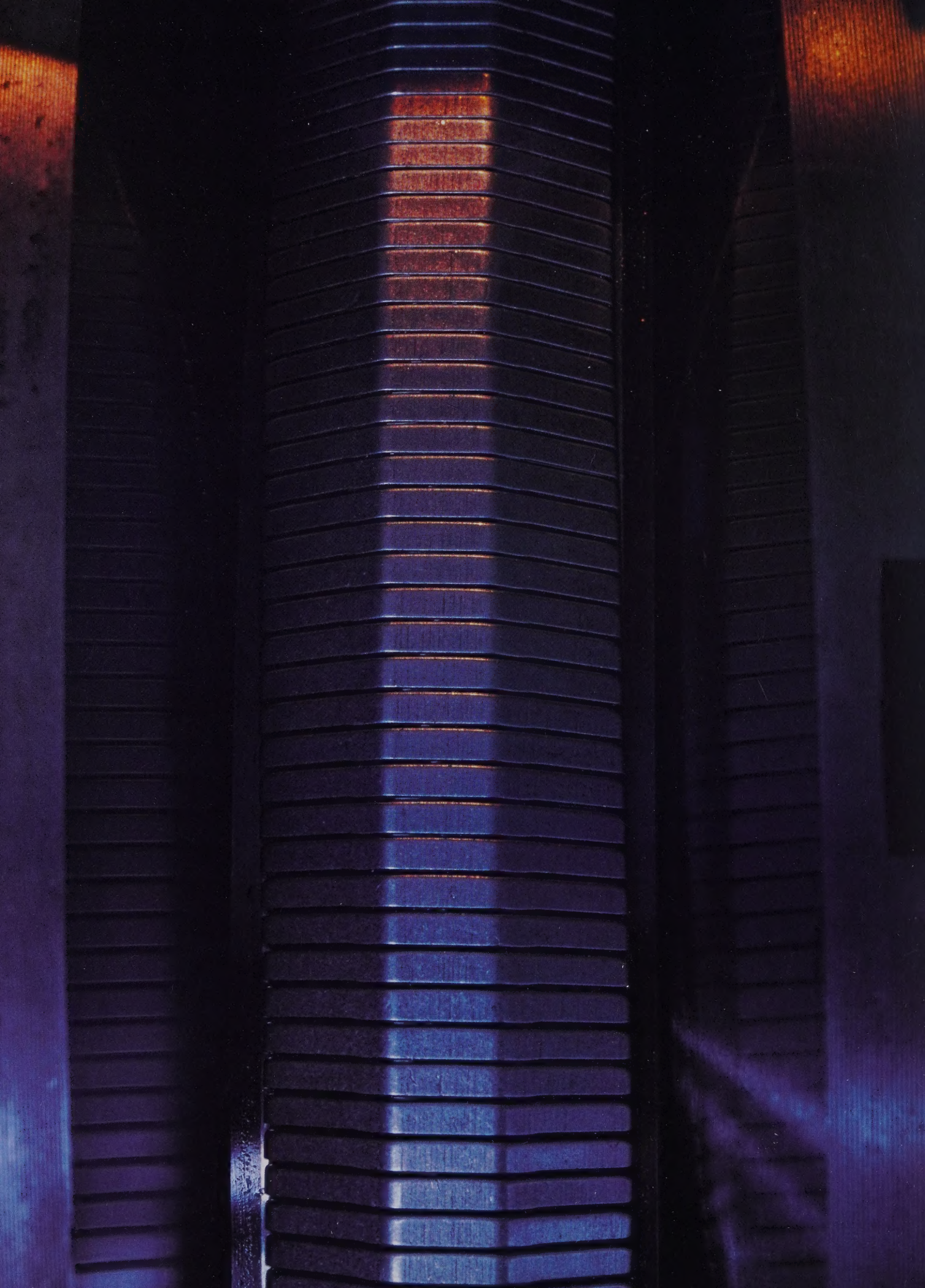
**Earnings up 16%; sales 17%**

**Margins slip slightly  
due to inflation impact**

**Return on equity tops 15%**

**Dividend rate up 15%;  
4th increase in four years**







# The year in brief

Year ended December 31

## Operations

	1979	1978	Change
	<i>(millions except per share data)</i>		
Net sales	\$2,717.4	\$2,326.0	+17%
Net earnings	155.6	133.8	+16%
Net earnings retained in business	111.8	94.5	+18%

## Per share of common stock

Net earnings	\$ 7.25	\$ 6.24	+16%
Dividends paid	2.075	1.85	+12%

## Financial data

Shareholders' equity	\$1,076.9	\$ 966.1	+11%
Return on average equity	15.2%	14.6%	
Book value per share of common stock	50.99	45.64	+12%

## Technology: testing, tribulation and triumph

*Short lengths of metal belt are all they are, but they assume impressive stature. Quite the opposite of traditional transmission belts, this one transmits torque by compression; each precision element pushes the one ahead of it. Its design is one key to a fuel-saving, small-car automatic transmission being developed cooperatively by Van Doorne Transmissie in The Netherlands, Fiat and Borg-Warner. Perfecting the concept of a continuously variable transmission has long been a quest of automotive engineers. We don't have all the bugs out yet, but we're working on them.*

Borg-Warner's growth and success in the past half century have resulted directly from our dedication to innovation. Our developments have improved the mobility, comfort and convenience of millions of people. Now, however, not just success but survival itself will depend on innovation geared to tomorrow's needs.

That is why Borg-Warner is making a larger commitment than ever to innovative technology.

The following pages tell about some of our developments and research programs. Many are related to energy efficiency.

In our constant testing of new ideas, we have had triumphs, frustrations and failures. Some of the developments pictured in this report may never come to commercial fruition. But they demonstrate the breadth of our inquiry—out of which will come the seeds of our business future.

## Inside this report

Financial and operating review	2
Management commentary	16
Inflation and its impact	20
Financial section	24-39
Officers and directors	40
The businesses of Borg-Warner	41



# Borg-Warner's 1979 performance set records of all kinds—for the fourth year in a row

For the fourth consecutive year, Borg-Warner sales, earnings and earnings per share were the highest in the company's history. Return on shareholders' equity topped 15% for the first time since 1955. Profit margin, however, slipped slightly—the first decline in four years.

Net sales totaled \$2.7 billion, up 17%. Earnings of \$156 million were 16% ahead of 1978. Per-share earnings equaled \$7.25, compared with \$6.24 in the prior year. Each of the company's major business areas shared in the sales uplift, and all but the Air Conditioning group had higher earnings.

Performance was helped by a sharp jump in earnings from the financial and protective services companies and a much lower tax rate for the year.

While earnings from manufacturing operations rose 11%, earnings from service-related operations surged 52% ahead of 1978. Nearly 18% of Borg-Warner's total earnings in 1979 was derived from service businesses. Ten years ago, service businesses contributed only 5% of total earnings.

There were bright spots among the manufacturing operations with the Chemicals and Plastics group showing a 50% jump in earnings. The Transportation Equipment group managed a 9% earnings improvement despite the depressed auto market in the U.S., and the Industrial Products group maintained its string of uninterrupted growth for the ninth year with a 20% increase in earnings.

A significantly lower effective tax rate, which was 35% in 1979 and 43% in 1978, also helped net earnings. The lower rate resulted primarily from a 2% reduction in the U.S. statutory tax rate for corporations, a tax credit on inventories related to U.K. operations, and favorable tax settlements in cases involving operations disposed of in prior years. Overall, the difference in tax rates contributed 78 cents to 1979 earnings per share.

More than offsetting this tax gain was the negative impact of continuing severe inflation. The last-in, first-out (LIFO) method of inventory valuation used by Borg-Warner on a worldwide basis results in a downward adjustment to earnings during periods of rising prices to recognize the effect of inflation. The LIFO adjustment to earnings in 1979 was 90 cents per share more than in 1978.

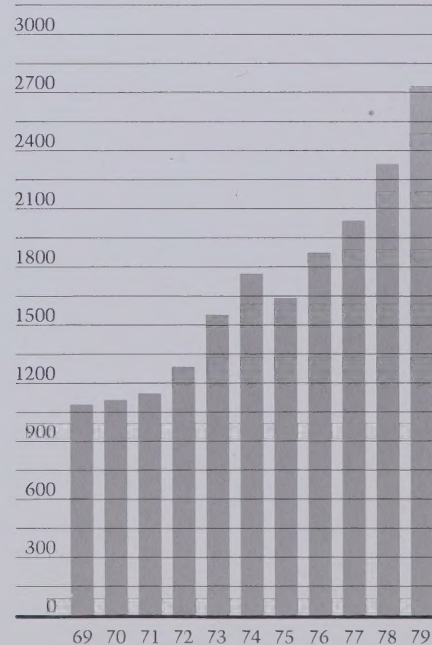
Sales of consolidated units outside the U.S. were a record \$794 million, up 25% from 1978, and nearly 30% of total sales for the company. Export sales from U.S. operations added another \$268 million to non-U.S. business and were 26% higher than the previous record in 1978. Non-U.S. profit margins continue to improve but still trail the return earned on U.S. manufacturing operations in 1979.

Earnings from affiliates were up sharply in 1979, especially operations in Japan.

Borg-Warner's financial condition remains strong. During the year, Borg-Warner's invested capital

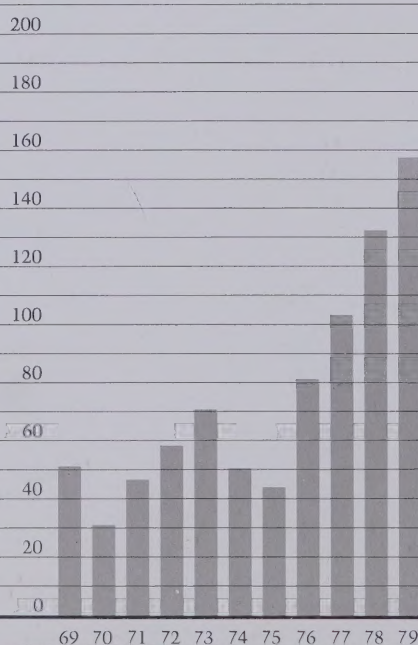
## Net sales

millions of dollars



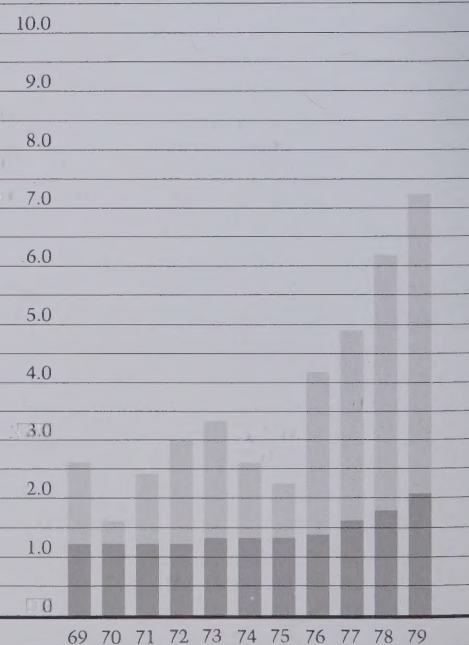
## Net earnings

millions of dollars



## Earnings per share Dividends per share

dollars





increased by \$135 million—\$111 million from equity growth and only \$24 million from added debt. However, of the \$111 million increase in equity, \$104 million was required to support the higher level of capital spending, higher dividends paid to shareholders and increased investments and advances, largely the reinvestment of earnings in unconsolidated subsidiaries.

As a result, cash flow was a negative \$49 million; and working capital declined by \$9 million, in spite of record earnings. These factors caused the company's current ratio to drop below the 2-to-1 mark for the first time in recent history. At the same time, the company's debt-to-equity ratio was held at a conservative 20% level.

Borg-Warner has established adequate reserves to cover contingencies, including the announced closing of the Letchworth transmission plant in the U.K. during 1980.

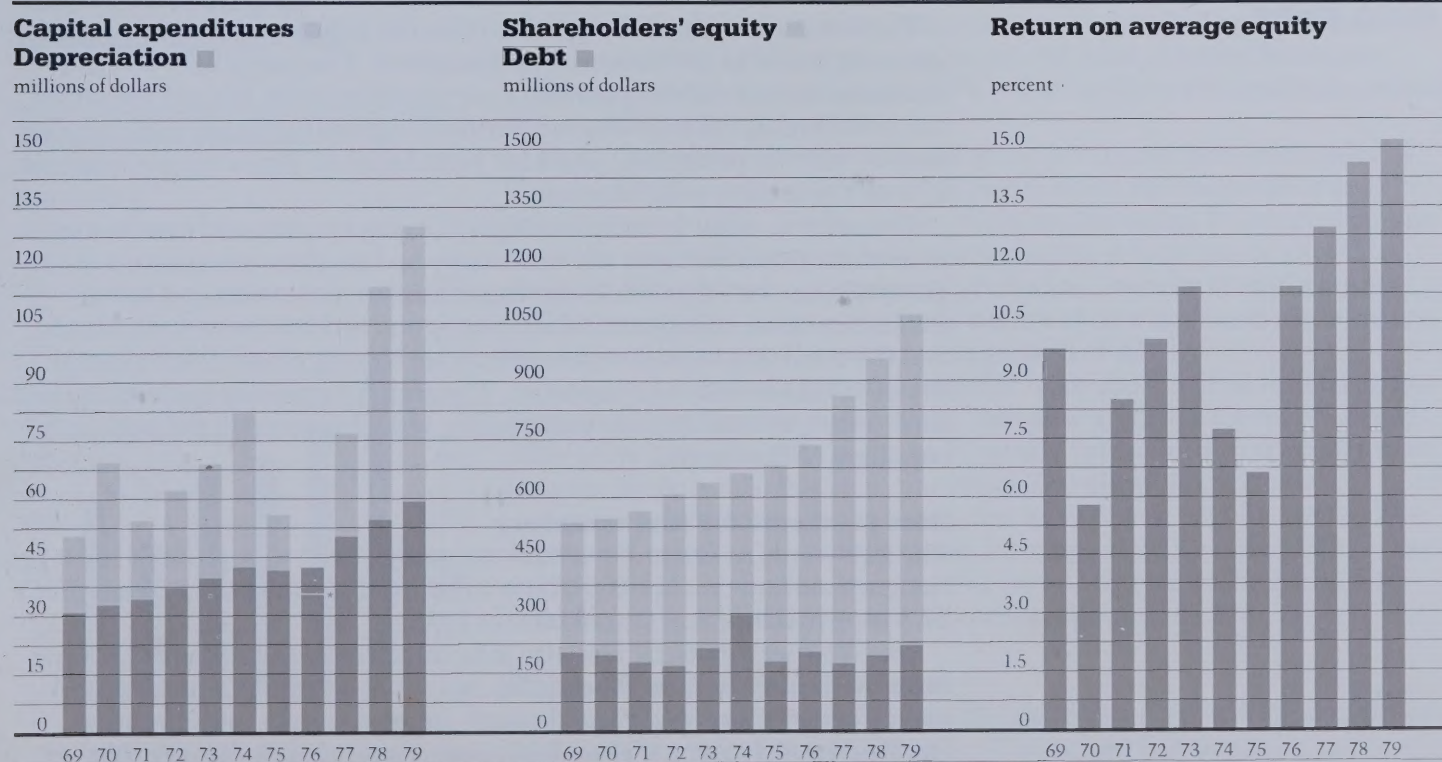
Inventories at current value were up 20%, and receivables 21%—slightly above the gain in sales for the year. The real quantity increase in inventories was only 6%, with 14% due to inflation.

Interest expense rose 24% because of generally higher rates during the year and slightly higher debt.

Capital expenditures, including capitalized leases, totaled \$131 million in 1979, compared with \$115 million the year before. In 1980, Borg-Warner expects to invest about \$125 million in new plants and equipment. It should be possible to finance this

investment without the need for additional borrowing.

In addition to new facilities, Borg-Warner invested \$56 million in research and development. This effort goes on at major divisions throughout the company and at the corporate research center near Chicago. Some of the technology and innovation that has resulted is featured photographically in this report.





# Group results show improvement in all but one area

## Sales and earnings by product or service area

(millions of dollars)	1979	1978	1977	1976	1975	1974
<b>Sales</b>						
Air Conditioning	\$ 570.3	\$ 516.9	\$ 439.2	\$ 352.5	\$ 313.1	\$ 312.4
Chemicals & Plastics	595.4	472.1	421.8	399.1	278.9	345.1
Industrial Products	552.3	474.1	434.3	410.4	378.6	316.9
Transportation Equipment	986.6	844.5	718.5	652.4	582.5	614.4
Sales of present operations	2,704.6	2,307.6	2,013.8	1,814.4	1,553.1	1,588.8
Discontinued operations	12.8	18.4	18.1	48.0	85.9	179.0
	\$2,717.4	\$2,326.0	\$2,031.9	\$1,862.4	\$1,639.0	\$1,767.8

## Net earnings

Air Conditioning	\$ 12.1	\$ 19.6	\$ 18.3	\$ 9.7	\$ 6.0	\$ (1.0)
Chemicals & Plastics	27.7	18.5	6.6	13.2	(2.3)	8.6
Financial and Protective Services	27.3	18.0	12.8	10.6	8.1	8.0
Industrial Products	41.7	34.7	33.8	21.3	17.6	12.4
Transportation Equipment	46.2	42.4	32.0	26.5	14.3	17.2
Earnings of present operations	155.0	133.2	103.5	81.3	43.7	45.2
Discontinued operations	.6	.6	.5	.4	.8	5.6
	\$ 155.6	\$ 133.8	\$ 104.0	\$ 81.7	\$ 44.5	\$ 50.8*

\*After accounting changes

## Transportation Equipment group had improved results despite downturn in auto sales

For the fourth year in a row, the units representing Borg-Warner's largest product area turned in improved sales and earnings. The 1979 performance was the toughest since it was achieved while U.S. auto production was falling to its lowest level in five years. Net earnings for the group in 1979 rose 9% on an increase of 17% in sales.

The diversification of the group within the broad transportation market was a big factor in 1979's strong performance. The group sells a variety of components not only to passenger car manufacturers around the world, but to the truck, off-highway, recreational, agricultural and marine industries as well. Replacement parts for vehicles of all kinds represent about 15% of the group's total business.

Contrary to what usually is assumed, components sold to new-car manufacturers (OEMs) in the U.S. make up less than one-quarter of the group's sales. Yet, these sales are important to its current and future success as more stringent fuel efficiency and environmental standards and the resulting capital requirements are forging closer relationships between OEMs and their suppliers. The ability to provide technology and innovation, as well as price and quality, will characterize the successful suppliers of the future.

## New products for fuel economy

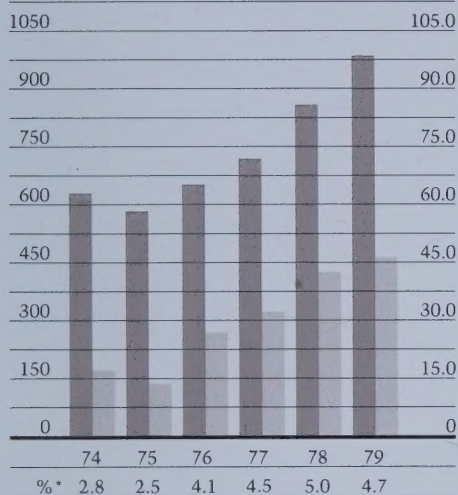
The key words in Detroit are "fuel economy." Each new product must be designed around that concept if it is to help OEMs meet the government's 27.5 mpg fuel efficiency mandate for 1985.

Borg-Warner products, recently introduced or in the advanced testing state, will contribute to this goal in two ways—through improved efficiency of the component and through reduced weight of the vehicle. On 1980 models are: a lockup torque converter clutch damper that



## Transportation Equipment

Sales ■  
Earnings ■  
millions of dollars



\*Margin on sales

reduces fuel consumption with automatic transmissions, a fan clutch that both saves fuel and reduces noise on heavy-duty trucks, a transfer case for part-time four-wheel drive for light trucks, and a more efficient transmission for medium-weight diesel-powered trucks.

Other products designed to save weight and/or energy are in the development stage. A number of them could be ready for market within a short time. They include: self-locking hubs that will put convenience and economy back into four-wheel driving, aluminum radiators, a continuously variable transmission for small cars that could make automatic driving smoother and more efficient, and perhaps eventually an electronically controlled automatic transmission for the ultimate in fuel efficiency.

### Non-U.S. markets strong

During 1979, 31% of the group's total sales came from non-U.S. operations, not including sales from unconsolidated units (primarily in Japan, where a record half million transmissions were sold, including a newly designed automatic with fuel-saving overdrive for Toyota).

And while the auto industry outside the U.S. will probably be down slightly in 1980, we do not expect the decline to be as severe as at home.

Transmission operations in the U.K. continue to be a nagging problem. After roughly break-even years in 1978 and 1979, and with the picture not much brighter for 1980, the group has announced the closing of its transmission plant at Letchworth. Manufacturing will be consolidated at the newer and larger plant in Kenfig, South Wales.

### Outlook guarded

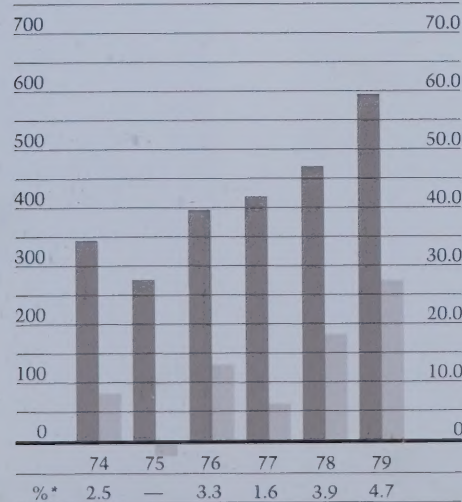
As 1980 began, new orders were down, production cutbacks and attendant layoffs were increasing, and a long strike at a major truck component customer were having a negative effect on early 1980 results.

New products and a positive model mix should help the group counter some of the decline in new-car sales. It is unlikely, however, that these factors will be enough to offset declines in both car and truck sales.

## Chemicals group shows strength around the world

### Chemicals & Plastics

Sales ■  
Earnings ■  
millions of dollars



\*Margin on sales

Despite skyrocketing raw material costs, the Chemicals and Plastics group set sales and earnings records in 1979. Leading the way were strong performance of the European business, steady demand for ABS plastics worldwide, new applications, and increased sales of petrochemicals.

Earnings for the group jumped 50% to \$28 million while sales increased 26% to \$595 million in 1979.

More than three-quarters of total group revenues come from sales of Cyclocac® ABS, a versatile family of engineering thermoplastics used primarily in durable goods, automobiles and housing. Its success comes from the adaptability of its basic formulation, which can be varied to produce ABS resins in a number of grades for a variety of applications.

This versatility opens a constant stream of new uses and is the reason for our confidence in the continuing growth of ABS.

Perhaps the greatest growth potential is for applications requiring specialty high-performance materials. Two new grades of Cyclocoy® brand ABS/polycarbonate alloy were successfully introduced in specialty markets for power tools, business machines and plumbing fixtures.

Another market gaining momentum in 1979 was ABS for refrigerator liners. All major U.S. manufacturers have approved Cyclocac ABS for use in their units—a market growing five times the rate of the entire ABS industry and expected to reach 200 million pounds by 1981.

### Capacity expansion continues

During 1979, Borg-Warner Chemicals added about 50 million pounds of ABS capacity to existing facilities in Illinois and California.







*If this pattern pleases, it shouldn't surprise. Objects designed for function alone often have the visual appeal of artwork. Pictured is a corner section of a new Borg-Warner radiator made of wave upon wave of aluminum sheet. The radiator's metal components are bonded in a special oven in a patented brazing process. There is no soldering, no mechanical joining. What emerges is an aluminum radiator 30% lighter than current brass and copper units. A sophisticated anti-corrosion system with time-release rust inhibitors for years of protection can be incorporated into the radiator. Pilot production begins in late 1980 at Long Manufacturing division in Canada.*

The group also announced construction of a \$50 million ABS plant in Mississippi. When completed in late 1982, the 150-million-pound plant will bring the company's total U.S. capacity to about 800 million pounds, a 40% increase, and world capacity to 1.2 billion pounds.

In the specialty chemicals business, Borg-Warner increased penetration of Weston 618™ heat stabilizer for plastics into the food packaging market. Weston 618 is less expensive and offers characteristics not commonly available.

Borg-Warner strengthened its non-plastics business in Europe in 1979 with the opening of a new Blendex® BTA modifier facility located in Scotland. The plant is Borg-Warner's worldwide source for BTA products and should be operating at full capacity by mid-1980. BTA is in strong demand as an additive for PVC used primarily in plastic bottles and film.

Also being considered is a 70% expansion of styrene monomer capacity at a Louisiana plant owned in partnership with American Petrofina. Styrene, one of three ABS ingredients, comprises up to 50% of the end product. The present plant provides more than enough styrene to meet Borg-Warner's needs, and the sale of the excess on the open market has been a significant contributor to group earnings.

### **Squeeze on margins will continue**

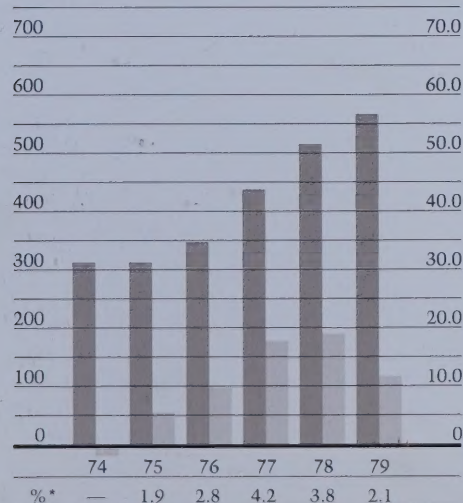
Rapidly escalating costs of raw materials and the resulting pressure on operating margins will continue to be a major problem in 1980.

During late 1979, U.S. consumer durables, automobiles and housing markets weakened. This condition is expected to continue into 1980. Since ABS sales are largely dependent upon these three markets, the group's outlook is tempered, although some offset is expected as a result of new applications.

## **Air Conditioning group hit by higher material costs, poor product mix**

### **Air-Conditioning**

Sales ■  
Earnings ■  
millions of dollars



\*Margin on sales

York® products fall into three broad categories of about equal sales volume: air conditioning and refrigeration equipment specially designed and engineered for large installations, unitary products of a standard design for cooling or heating homes and small to medium-sized commercial buildings, and compressors for vehicle air conditioning systems.

Although 1979 sales for the group were again a record, earnings dropped 38% from the record \$20 million York earned in 1978.

Several factors were responsible for the poor 1979 performance. Most severe perhaps was a shift in product mix. With both the auto and housing markets in a state of decline through much of the year, York had unused capacity at the two plants producing for those markets.

At the same time, York's third major market, commercial and industrial construction, showed continued strength. York's backlog of orders for large systems to meet this demand already was swelled by a two-month strike at the end of 1978. It grew even larger as the year progressed, with York unable to keep pace with heavy incoming orders. The situation has improved. Recent shipments are at all-time highs, and York expects to make on-time delivery for most 1980 orders.

However, the shipment delays that occurred in 1979, as well as stiff cost increases (especially for aluminum and copper) that could not be fully recovered in the marketplace, cut deeply into York margins. This pressure on profitability will continue during 1980.

Another problem for York during 1979 was reduced orders for compressors from new-car makers and from the add-on market, where York was hurt by a severe drop in van and RV sales induced by the gasoline shortage. The planned introduction of a new, small rotary compressor is expected to increase York's market share. The compressor is targeted at the growing imported small-car market, which represents approximately 25% of the U.S. market available to York.







*Rare is the plastic that can stand up to a Bunsen burner's hot, blue flame. However, when heat sears this stick of plastic, bubbles form to create a protective layer of insulating foam between plastic and flame. A new chemical additive—developed and still under test at Borg-Warner's research center—has made the vital difference. Plastics containing this additive will not support combustion and give off substantially less smoke and fumes when exposed to flame. Potential applications include internal components for television and telephone equipment and mass transit interiors where nonconductive, flame-resistant materials are required for safety. Test marketing is planned for late 1980.*

## Non-U.S. business mixed

Export sales remained at high levels, up 16% from 1978. They are expected to hold steady in 1980 despite some softening of Middle East sales. Losses in Iran were minimal, but the situation there has resulted in lost business opportunities.

Non-U.S. sales were above 1978 levels in all areas, and especially in Mexico. Profitability of European operations, however, suffered due to labor unrest in the U.K., the costs of changing product offerings to meet shifts in demand and the strength of the pound sterling against the dollar.

Service business was again one of the bright spots in York operations. Record-high revenues and earnings were achieved in 1979.

## Technology buoys York outlook

York's success in combining the cost-effective inverter, developed by Borg-Warner Electronics, with a sophisticated electronic control system that automatically and constantly matches air conditioning compressor speed to varying air conditioning load requirements can save energy and reduce commercial building operating costs. At test installations in operation for up to two years, energy consumption of the centrifugal chiller has been cut up to 30%.

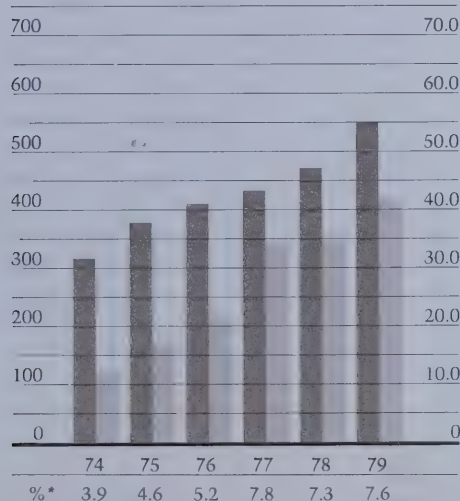
The new Turbomodulator system can be installed in new or existing buildings whether they use York or competitive chillers. Production of retrofit units has begun. First deliveries of systems for new buildings are slated for the second quarter of 1980. Resulting energy savings should pay for the equipment within three to five years.

Start-up costs for the new product will be high through 1980, and sales of the product itself will not have much effect on Borg-Warner 1980 net earnings.

## Industrial Products group margin, ROI are highest in the company

### Industrial Products

Sales ■  
Earnings ■  
millions of dollars



\*Margin on sales

The Industrial Products group continued to lead all Borg-Warner operations in profitability on sales in 1979 with a margin of 7.6%, compared with a return of 4.7% for the company's manufacturing operations overall. Return on investment for this group is the highest in the company.

Earnings for the group were \$42 million, up 20% from \$35 million the year before on a sales gain of 16%. The major components of the Industrial Products group include the energy equipment units and Morse Chain division.

Despite loss of some business from Iran and the lack of a well-defined U.S. energy policy, the energy equipment units (Byron Jackson Pump; Centrilift, Inc.; Nuclear Valve; and Mechanical Seal) showed continued improvement in 1979. (In early 1980, Borg-Warner signed a letter of intent covering an exchange of Centrilift, Inc. assets for common stock in the Hughes Tool Company. See page 17.)

A variety of sophisticated products and product refinements was introduced in 1979. Centrilift introduced a new rotary gas separator, a high impedance transformer and a heat-resistant submersible pump cable, all used in oil production. The Mechanical Seal division introduced two types of improved seal systems to help users meet increasing EPA requirements.

New orders for nuclear power plant components have slowed but have not dried up completely—especially outside the U.S., where nuclear construction plans are being implemented. A backlog sufficient to maintain production at a healthy pace through '80 and '81 is holding firm.

## Petroleum involvement brightens future

The rush to find and extract oil around the world is a good sign for the energy equipment units. Expanded petroleum activities in Mexico, the Middle East and Continental Europe will more than offset business lost in Iran during 1980.







**No tarantula this.** It's a busy little gate driver with a key role to play in a new, energy-saving air conditioning system from our York division. The driver gets its instructions from an electronic brain at the heart of York's variable speed control system. The brain senses the cooling required; the inverter provides variability, permitting the air conditioning compressor to run slower when the load is lighter. Speed and need are precisely and automatically matched. With the chiller motor no longer churning constantly at full speed, energy saving is considerable—up to 30% of normal energy consumption for centrifugal chillers, which represent a large part of the total system.





Expanded service activities in Europe, the Middle East, Canada, Mexico and particularly in the U.S. will provide increased sales and earnings in 1980 and beyond. The growth in U.S. pump aftermarket sales is expected to increase in excess of 20% per year over the next five years.

U.S. and Canadian "synfuel" programs could result in major contract awards during 1980 for Byron Jackson Pump.

### Morse Chain continues record pace

Morse Chain division, the second major component of the Industrial Products group, enjoyed another record year in 1979. Sales of both automotive and industrial products were strong for the first three quarters, tapering off in the fourth quarter.

The backlog of orders for Morse Chain was up 26% over 1978. A significant portion of the increase in backlog was attributable to the expansion of the OEM industrial roller chain business.

The successful introduction of General Motors' energy-efficient "X-body" cars has meant increased sales for Morse's Hy-Vo® drive chain, which is used on those cars as well as on GM's larger, front-wheel-drive and four-wheel-drive models. By 1985, a large percentage of U.S.-built cars will be front-wheel-drive vehicles.

Morse Chain will begin marketing a family of alternating current inverters for electric motors during 1980. Combining microcomputer technology with a power transistor, these inverters provide substantial energy savings in a wide variety of applications.

Continued strong growth, near 30%, is expected for the Hy-Vo chain line in 1980. Otherwise, it appears that sales for Morse's automotive and industrial products will be flat during most of the year with some rebound expected in the fourth quarter. Sales of the new inverter are expected to build gradually during the year with momentum building into the 1980s.

Ingersoll Products recorded the best year in its history, and incoming orders for 1980 thus far indicate a repeat performance.

*Were they petals of delicate flowers, these strands of copper conductors couldn't be protected and pampered more. Viewed here in cutaway, the conductors are wrapped in a tough cocoon of insulation, tape and braid and sheathed in shiny armor. Yet, with all this protection, they can still "breathe" and thereby withstand the 250°F heat in oil wells. Developed by Centrilift, Inc. and the Borg-Warner research center, this heat-resistant power cable eases problems of oil recovery from new and secondary wells by feeding power to pumping units far below the earth's surface.*

The pace quickened for the Financial Services group in 1979 with net earnings increasing 31% to a record \$21 million. In face of the highest interest rates in U.S. history, the group reported its 14th year of uninterrupted earnings improvement. Earnings increased dramatically with only an 8% gain in employment.

At year-end, the group's gross receivables totaled \$1.7 billion, up 25% from the prior year. With at least 50% of the group's finance receivables geared to prime rate and more than 70% of its receivables maturing in any 12-month period (compared with only 30-40% for most finance companies), the group probably weathered rising interest rates better than many of its competitors.

Factors contributing to record results were the penetration of new markets in the U.S. and good growth in Canada and Australia. The group's international business continued strong in 1979 with receivables acquired up 26% over 1978.

The largest segment of the group is Borg-Warner Acceptance Corporation (BWAC), specializing in four business areas: inventory financing, insurance, retail financing and commercial/industrial leasing. Inventory financing is the major BWAC service with about 50% of its revenues generated in this area.

BWAC provides inventory credit for manufacturers, distributors and dealers in industries such as home electronics, recreational vehicles, appliances and agricultural equipment. In 1979, this business grew by 27%; and a special division was set up to handle marine financing.

Each major segment of the group had improved performance in 1979 with the exception of leasing. The latter was off substantially due to increased credit losses and higher interest rates which could not be

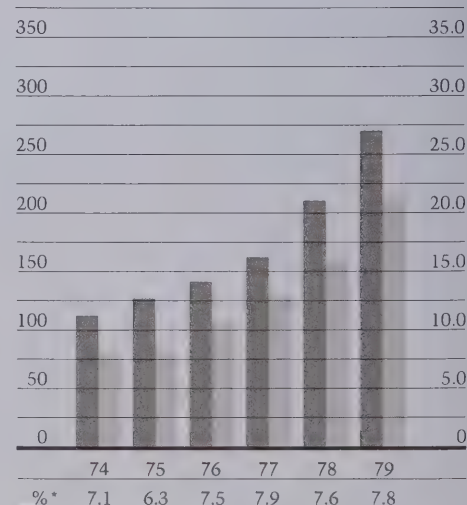
### Financial Services records 14th year of steady growth

#### Financial Services

Total finance income ■

Net earnings ■

millions of dollars



\* Margin on total finance income







compensated for on longer-term contracts—characteristic of the leasing business. The insurance unit, smallest but fastest growing unit within the group, had a record year.

During late 1979, the Financial Services group was reorganized to consolidate reporting responsibilities. The reorganization strengthens BWAC's operations and makes it easier to add new businesses.

Interest rates will probably remain high in 1980, which could have a further negative effect on equipment leasing earnings and several less significant businesses. Even though higher interest rates could also increase collection problems, BWAC continues to maintain an above-average collection record in the industry.

All other businesses look strong for BWAC in 1980. Continued growth in Europe and Canada in the inventory financing area for appliances and recreational vehicles is expected. The credit life insurance business should also grow substantially. Overall, the Financial Services group should report its 15th straight year of record earnings in 1980.

Baker Industries—acquired in 1977—experienced good growth in 1979 with revenues increasing 13% and net income 226%. The improvement comes after a year that was below management expectations, partially due to costs related to a plant closing.

Baker, comprising the protective services companies, recorded earnings of \$6.2 million, compared with \$1.9 million in 1978. Revenues totaled \$236 million in 1979 versus \$210 million the year before.

The company's Wells Fargo alarm, armored and guard operations grew 22% in revenues and 14% in earnings in 1979. Revenues for the Pony Express Courier division—a unit that delivers time-critical business materials—grew impressively in 1979 with a 25% revenue increase.

The year was marked by new product development, greater market penetration, a major acquisition and the moderate easing of a problem in the residential smoke detector industry.

### **New production innovation**

The alarm division of Wells Fargo shipped its first multiplex computerized security system during the year. Expected to become a major factor in the alarm business, the sophisticated system offers customers increased security and efficiency not found in competitive systems. With the new multiplex system, customers can program in constantly changing security instructions to match their particular needs.

With the acquisition of the Burns International central station and local alarm business, Wells Fargo now has the second largest alarm network in the U.S. providing service to 30 major metropolitan centers.

### **Residential smoke detectors still a trouble spot**

Though the residential smoke detector business continued to decline in 1979, the drop was not as steep as the previous year. Excessive inventories and depressed prices continue to plague the industry. During the year, Baker initiated various cost-cutting measures, including the closing of one manufacturing plant to streamline its smoke detector operation. This part of the business has not been profitable.

Baker provides the widest selection of protective services of any company in the U.S. As a result, it has a solid position in the marketplace. During the coming year, integration of the Burns International alarm business into Wells Fargo should be completed; and a strong demand for multiplex system installations is expected.

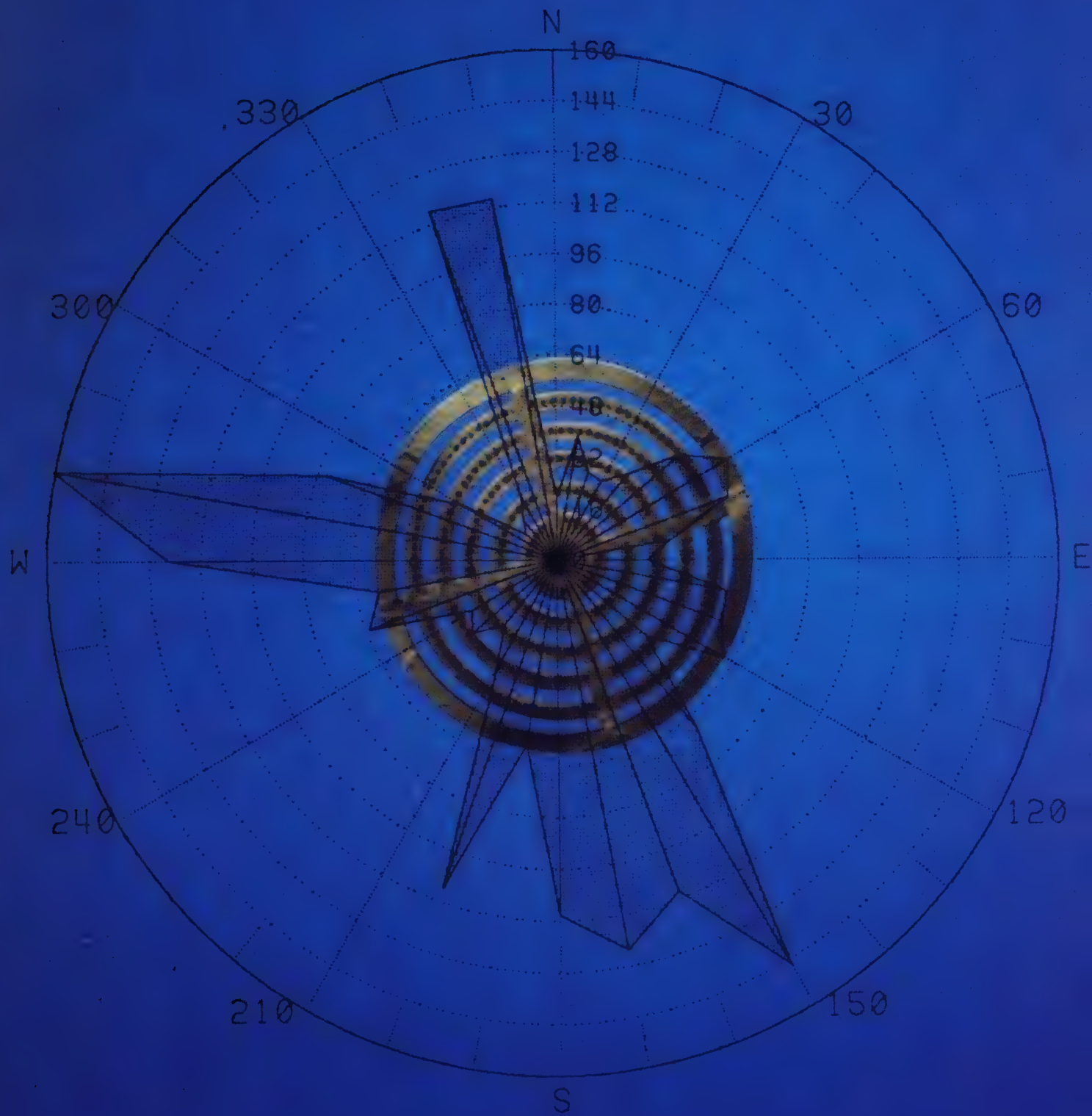
With exception of residential smoke detectors, all of Baker's businesses have good growth potential for 1980. Demand brought on by crime, fire and insurance company pressures should mean continued improvement for the group.

## **Protective Services' business rebounds in second year**

*Ill wind or no, the client needs to know—right now—if its manufacturing operations should ever exceed (or even threaten to violate) pollution control standards. Quick, corrective action can save a fine—and our environment. Borg-Warner's Kemron Environmental Services, with a master computer and a network of on-site "Kemputers," can measure the quality of the environment, document it quickly and graphically, and warn of trouble—sometimes even before it breaks out. This eye-catching overlay illustrates the point. Software packages are tailored to meet each client's needs.*



IND DIRECTION VERSUS AVERAGE CONCENTRATION  
(MICROGRAMS/CUBIC METER)





# Strategic planning brings progress toward five-year plan goals

(An interview of chief executive officer James F. Beré, February 26, 1980)

*How did Borg-Warner's performance through 1979 measure up to the objectives set five years ago as part of the company's strategic long-range plan?*

We have made considerable progress since initiating our five-year plan, and for that I am grateful to our employees throughout the company. Even so, our progress hasn't been sufficient to meet some of the tough goals we set five years ago.

There were two basic thrusts to our long-range planning. First was to reduce the cyclicity of our business by expanding into the faster-growing service sector of our economy. As a result of the acquisition of Baker Industries and the continuing growth of our Financial Services companies, 18% of our earnings are now derived from service operations, compared with only 5% ten years ago.

The second emphasis of our strategic planning was to improve the efficiency and profitability of our current businesses. We concentrated on two key indexes of operating efficiency—asset management and profit margins on sales.

We more than achieved our goal of making our assets work harder by increasing our capital turnover rate from 1.6 to 2.3 times annually.

Improving margins has been more difficult. As a consequence, we may not achieve our key objective of reaching the *FORTUNE* 500 median return on equity for 1979 when rankings are announced in May. High inflation has made it an even more difficult task, but that is where we will concentrate our efforts under our new five-year plan.

*What are your margin goals, and what can you do differently in the coming five years to achieve them?*

Our 1984 goal is to increase our margin on sales from manufacturing operations from 4.7% to at least 6% on sales of \$5 billion.

To get there we must hold to our gain in asset turnover while improving the effectiveness of our operating functions. And that's where Jerry Dempsey, our new chief operating officer, has a job to do.

*Do you agree that inflation is the major problem we face today; and, if so, is there a remedy?*

I don't think there is any question that inflation is the most obstinate economic problem we face today and one that is getting worse. Perhaps if we could agree on the causes of inflation, a solution would be more likely. One of the causes is the automatic inflation

adjustments we continue to build into our economic system. They do nothing but make an eventual cure more painful for everyone.

We must convince our political leaders that inflation is a blight we are serious about eradicating and that we are willing to sacrifice to achieve its demise. The trick will be to develop a plan to even out the sacrifices. A clear mandate from the electorate is needed to prod officials into action toward this end.

(A special story on inflation and its impact begins on page 20.)

*Energy would seem to be critical to several of your product areas. What effect is the current situation and the outlook likely to have on these businesses?*

I'm basically optimistic—primarily because of what I believe is the ability of the American people to assess negative situations and turn them into positive ones.

While we would rather the problem did not exist, it has presented real opportunities for Borg-Warner.

The energy shortage is creating revolutionary changes in the automobile industry and the way Americans view their car. Rather than spelling the industry's demise, I believe it will bring a needed revitalization. And through technology and innovation, I see supplier companies like ours emerging as a bigger part of the finished product.

The energy situation may change the type of dwellings we live in, the cars we drive, and the way our communities are structured, but it will not stop our economy from finding new paths for growth.

*The inverter advances announced by Borg-Warner could mean significant energy savings. What do these product developments mean to the company?*

Long range, I feel the inverter—and more important, its application in a number of our product areas—will have a very positive impact on our results. In its first year, however, it won't be much.

We believe the potential market is huge, and we continue to uncover applications we hadn't thought of initially. The difficulty will be to convince builders of homes and owners of large buildings that they should spend more for a product just because it saves energy when the savings in operating costs will accrue to the eventual owner or tenant.





Robert O. Bass and James F. Beré

*Why did you decide to exchange Centrilift, Inc. for shares in Hughes Tool Company?*

A bit of background might help explain our reason. Borg-Warner already owned 3.75 million shares of Hughes' common stock issued in exchange for our oil well service operations in 1974. This has proved to be a very successful transaction for both companies. Because the sharply focused nature of Hughes Tool closely matched that of the unit we sold them, that unit has grown and prospered to a greater degree as part of Hughes than would probably have been the case had it remained part of Borg-Warner. In exchange, our investment in the form of Hughes stock has proved a very satisfactory one for Borg-Warner shareholders. We expect the same will be true in the case of Centrilift. The additional 1.2 million shares of Hughes Tool common stock we would receive would give Borg-Warner slightly more than 20% of Hughes Tool's common stock outstanding. This would permit us to include that share of Hughes' profits in our future earnings. Because of the future growth we expect for both Centrilift and Hughes, we believe the transaction will allow Borg-Warner shareholders to participate more fully in the vital energy market.

*What happened to the proposed merger with Firestone, and what is your current acquisition posture?*

The Firestone merger proposal was aborted for one simple reason: they decided to ask for more money than called for in the initial agreement. It was our feeling that the risks and potential rewards to our stockholders did not merit an increase. Looking back, I'm not too unhappy about the way it turned out.

I would describe our present acquisition posture as active. We still would like to find a well-managed, service-related organization to expand our participation in this segment of our economy. We are also looking at opportunities to strengthen our current businesses.

*What do you see ahead for the economy and for Borg-Warner in 1980?*

I look for the economy to be relatively strong in the first quarter with some slowdown beginning thereafter. A recession could be deeper and longer than many expect, and my real concern is with 1981 prospects.

Right now, I feel Borg-Warner will have a good year; but it would be folly to make a prediction. At the same time, I do believe we have the capability to outperform the economy overall.



# Borg-Warner: yesterday, today...

*Dear Borg-Warner investors and friends,*

There are a number of things I would like to talk with you about in this—my last letter reporting to you as chief operating officer.

I'm confident that Jerry Dempsey, who succeeds me in that job, has the ability and experience to continue the record of improved operating results we have achieved at Borg-Warner during the last several years.

I've always felt one of the most important responsibilities of leadership is to ensure there are opportunities and challenges for qualified younger people within the organization. A balance of young managers with fresh ideas and "old salts" with the wisdom gained through hands-on experience is a necessary ingredient of any ongoing management team. Jerry's election as chief operating officer provides that balance at Borg-Warner and will help ensure our continued progress and vitality.

At the small company I came from the key problem was always money. When I joined Borg-Warner through an acquisition, I soon found the key concern here (and I think probably in most large companies) was not money, but people. Our ability to grow and prosper depends on our ability to attract, motivate and keep good people.

In the more than twenty years that I have been part of this company, this situation has not changed. What has changed is that most of our management now recognizes this fact. We've stopped just talking about it and started at least a few programs I think will help us deal with the problem. Doing so has changed the entire tone of our company.

The larger the company, the more difficult it is to solve this people problem. Part of the solution, therefore, is to run each part of our big company as if it were a small one. Let the big company worry about the money, and the small one about the people.

Easier said than done. But at Borg-Warner I believe we've made progress. Our so-called "strategic management" system has divided Borg-Warner into more than 100 small businesses. Each one serves its own markets, and each has access to the capital needed to dominate those markets.

While this system has moved us more toward central control of strategic planning and allocation of resources, it has kept the day-to-day operating responsibility with people at the local level.

In this environment, people can better know each other, and motivation and initiative are strengthened among employees at all levels. The company can afford to encourage prudent risk taking and the intelligent mistakes that come with it in building a cadre of experienced young managers.

I'm convinced the key to making our system work is the development of meaningful, two-way communication throughout our organization. And, I'm not referring to management broadcasting, which we've always done. I'm talking about creating an environment where a person doing a job cares enough to raise a fuss when something is going wrong, where the boss cares enough to listen, decide if there is anything to the complaint, and do something about it quickly if there is. That is two-way communication.

The best way I know of to really increase productivity is to work toward a common goal agreed to by everyone. Productivity does not result from management exhortations to work harder. It comes from a mutual understanding about the tools, the systems, the incentives and the environment needed to make production easier, more efficient and more rewarding for all who participate in the process.

It's simply a common interest philosophy. That's what the changes at Borg-Warner are meant to achieve. We're not there yet, not by a long way. But because of our traditional decentralized philosophy, we perhaps have a better chance of eventually carrying it off than many other large companies.

Not only has there been change within our company, but the environment in which we operate as a company has changed. Our relationships and responsibilities to people other than customers, employees and shareholders have expanded. In the list we must now include: government, special interest groups and our plant communities. But this has not altered our basic reason for being: to produce goods and services at a fair profit, which results in the creation of jobs and contributes to a better life for more people.

If you've read this far, you might reasonably be asking: "Why have you been telling me all this? I'm an investor, not an employee?"

I think there is a good reason, assuming my philosophy is correct. Our development into a better company—and a better investment—depends on our ability to create a "common interest" environment among *all* our employees, regardless of collar color.

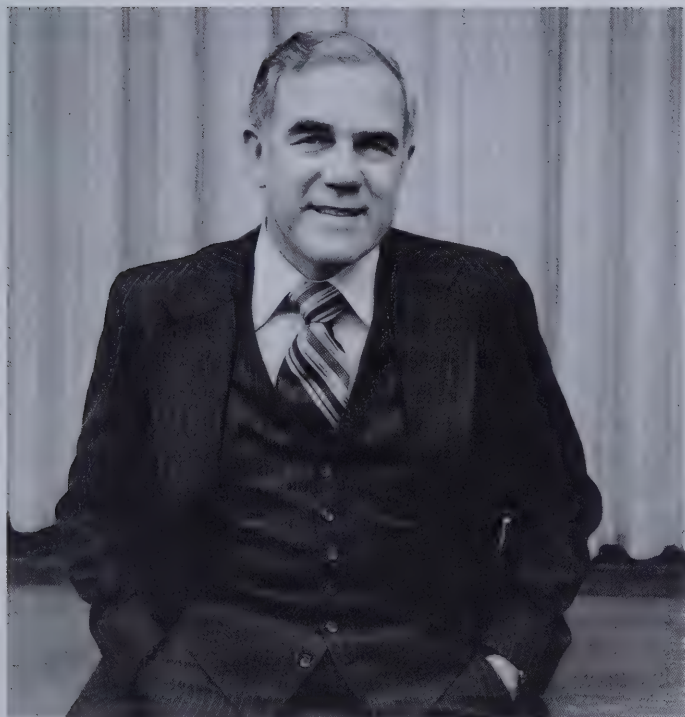
If, in fact, Borg-Warner can build an environment which will encourage and permit employees to contribute to the extent of their ability, then, as has oft been said: "You ain't seen nothing yet." We are committed to try.



Robert O. Bass  
Vice Chairman

February 25, 1980





Jerry E. Dempsey

Jerry E. Dempsey, Borg-Warner's newly elected chief operating officer, talks about his challenges:

*"Much of my energies will be devoted to improving margins, a task which is absolutely essential in the face of raging inflation.*

*"While we have accomplished a great deal over the past five years through sound asset management, our future rests on improving our operating results. Among other priorities, that means building the common interest philosophy Bob Bass refers to, reducing costs and putting additional muscle into our technology development and creative marketing.*

*"Our marketing efforts must feature a growing role for research and development. Technology is the key to developing products that command high margins. I am particularly encouraged by our progress in applying intelligent electronics to a variety of our products. Certainly the energy shortage has brought problems and hardship, but it also carries the seeds of opportunity.*

*"Finally, we face a philosophical challenge—to encourage our operating managers to think long range. In a recessionary environment, operating people are tempted, understandably, to make cut-backs in critical areas to provide a quick fix on their bottom line. By doing this, however, we risk mortgaging the future for the sake of making this month's objective. I plan to encourage our managers to invest in areas that have long-range potential, even if the immediate economic outlook is less than inspiring. We're in business for the long haul, and the managers who help prepare us for it will share in the rewards."*



# Inflation—we must do more than worry about it!

by James J. Gavin, senior vice president—finance

We hardly noticed inflation when it was only 2% or less per year. Nobody got hurt much. In fact, some economists contend that a little inflation is necessary to lubricate a healthy economy. But with inflation (based on the consumer price level) averaging better than 7% over the last decade, and in double digits during the last year, everyone is hurt.

Most dictionaries define inflation in purely economic terms. It is explained basically as the relationship between the supply of money and the supply of goods and services. I think Conference Board chief economist Albert Sommers is on track in suggesting the cause of inflation is as much social as economic.

The increasing demands placed on the economy by the public and private sectors have exceeded our available resources to respond to those demands. The fact that the public sector has grown so much faster than the private sector has contributed enormously to the problem.

But, whether inflation is in fact caused by an excessively fast expansion of the money supply or whether expansion of the money supply is caused by swelling demands is not the concern of the retiree, the wage-earner, or the businessman. All they know is that their money won't buy as much as it would last year. They've lost, and they can feel it. The question is: "Who has gained?"

The question might better be: "Who has lost least?" Certainly those who *owe* money lose less than those who *own* it in inflationary times. Certainly those who find themselves sheltered by pension or compensation programs that are indexed to consumer prices lose less than those who do not.

It is popular to look for inflation scapegoats. They are not hard to find. In fact, each of us has contributed to it: the federal government, which will have piled up a deficit of \$116 billion in the three fiscal years ending in 1980; the business community, which has worried more about passing on higher costs through higher prices than it has about reducing costs and improving efficiency; the worker, who has supported calls for wage increases that are indexed for inflation and greater than productivity improvement; and also the consumer, who has gone on an extended credit buying binge to hedge against inflation.

The real problem is that we, collectively as a nation, have been living substantially beyond our means for a long time. This condition cannot go on indefinitely. Something must give. We must cool the overheated demand in the private sector and slow the programs that contribute to federal deficits in the public sector. We must establish programs to reduce overall growth in the economy and restore a healthier flow of capital for the supply side of the economic equation. If we don't, the self-perpetuating momentum of the inflationary spiral will continue until the only thing left running is the government printing press.

But enough on the problem of inflation in general. What about inflation's impact on Borg-Warner and its shareholders?

The data on the opposite page give us an indication. The lighter number in each column in the first table shows the actual dollar amount for that item as reported for that year. The bold number is the same data adjusted for inflation (or changing prices as the accountants refer to it) in terms of current 1979 dollars. For example: Reported Borg-Warner sales in 1976 were \$1.9 billion. Those same sales today would equal \$2.4 billion in 1979 dollars.

The basis for adjusting prior year numbers to 1979 dollars is the Consumer Price Index (CPI). This index is the last line in the table. It is only one of several measures of inflation we could have used, but we believe it shows inflation on a "worst-case" basis. This index grew by 47.2% over the period—a compound annual increase of 8%.

The bold numbers in the right-hand column show the extent to which Borg-Warner was able to keep pace with the rate of inflation in real values during the last five years.

How did we do? While reported sales grew at an average annual rate of 9% between 1974 and 1979, the



### Comparison of selected data adjusted for effect of changing prices

(millions of dollars except share data)	As reported Adjusted (1979 dollars)						Average annual rate of change
	1979	1978	1977	1976	1975	1974	
Sales	\$2,717.4 <b>2,717.4</b>	\$2,326.0 <b>2,587.9</b>	\$2,031.9 <b>2,433.8</b>	\$1,862.4 <b>2,374.7</b>	\$1,639.0 <b>2,210.4</b>	\$1,767.8 <b>2,602.0</b>	9.0% <b>.9</b>
Net earnings	155.6 <b>155.6</b>	133.8 <b>148.9</b>	104.0 <b>124.6</b>	81.7 <b>104.2</b>	44.5 <b>60.0</b>	50.8 <b>74.8</b>	25.1 <b>15.8</b>
Earnings per share	7.25 <b>7.25</b>	6.24 <b>6.94</b>	4.93 <b>5.91</b>	4.21 <b>5.37</b>	2.31 <b>3.12</b>	2.66 <b>3.92</b>	22.2 <b>13.1</b>
Common stock dividend	2.08 <b>2.08</b>	1.85 <b>2.06</b>	1.65 <b>1.98</b>	1.41 <b>1.80</b>	1.35 <b>1.83</b>	1.35 <b>1.99</b>	9.0 <b>.8</b>
Book value per common share	50.99 <b>50.99</b>	45.64 <b>50.78</b>	41.10 <b>49.23</b>	38.36 <b>48.91</b>	35.51 <b>47.89</b>	34.63 <b>50.97</b>	8.0 <b>—</b>
Market value per share	35.88 <b>35.88</b>	28.38 <b>31.63</b>	27.88 <b>33.38</b>	30.50 <b>38.88</b>	20.00 <b>27.00</b>	13.38 <b>19.69</b>	21.8 <b>12.8</b>
Capital expenditures	130.7 <b>130.7</b>	115.3 <b>128.3</b>	77.0 <b>92.2</b>	36.0 <b>45.9</b>	55.9 <b>75.4</b>	83.0 <b>122.2</b>	9.5 <b>1.4</b>
Depreciation	59.6 <b>88.6</b>	55.2 <b>86.0</b>	50.9 <b>81.8</b>	43.4 <b>77.5</b>	42.8 <b>83.6</b>	43.1 <b>88.8</b>	6.7 <b>—</b>
Net earnings adjusted for constant dollar depreciation	<b>126.6</b>	<b>124.2</b>	<b>103.7</b>	<b>82.0</b>	<b>34.1</b>	<b>49.4</b>	<b>20.7</b>
Consumer price index urban yearly average (base year: 1967)	<b>217.4</b>	<b>195.4</b>	<b>181.5</b>	<b>170.5</b>	<b>161.2</b>	<b>147.7</b>	<b>8.0</b>

### Impact of changing prices on operating margins

	Operating margin (FIFO)		Operating margin (LIFO)		Operating margin current cost*	
	1979	1978	1979	1978	1979	1978
Air Conditioning	7.5%	9.3%	4.3%	8.2%	3.6%	7.7%
Chemicals & Plastics	12.6	10.0	9.5	9.2	8.2	7.5
Industrial Products	16.6	16.2	14.4	15.1	13.7	14.1
Transportation Equipment	10.2	12.1	8.3	10.6	7.0	9.7
Total	11.5%	11.9%	9.0%	10.7%	7.9%	9.7%

FIFO, or first-in, first-out, values inventories at current cost.  
LIFO, or last-in, first-out, values inventories at historic cost.

\*Operating margin on a LIFO basis, excluding the excess  
of current cost over historical cost depreciation.



real growth, when reduced by inflation during the same period, was less than 1%.

The pattern looks much better for net earnings. Reported earnings increased at an average annual rate of 25% over the five years. Real growth has been lower—but at nearly 16%, a darn good performance.

Our real growth in earnings was significantly higher than growth in sales for several reasons. First, Borg-Warner earnings in our base year of 1974 were depressed by our change to the LIFO method of inventory valuation and the recession that began that year. In addition, we have since made substantial improvement in our return on sales from manufacturing operations and have added to our service business base through excellent internal growth and acquisition.

Per-share earnings increased at a slightly lower rate because we issued two million new shares of common stock to Robert Bosch GmbH in 1977.

The next category hits shareholders closer to home. Common stock dividends have risen 9% per year in current year dollars but have barely stayed even in real terms over the period. In spite of increases in each of the last four years, our dividend payout did not keep pace with our earnings increase. Our dividend policy is to pay out about 40% of prior year's earnings, averaged over the long term. We would like to continue that pattern of annual dividend increases, even if we have a flat or down year in a recession.

Another figure that should have great significance for our shareholders is the book value calculation. The light numbers in reported dollars indicate a compounded growth of 8% per year. In other words, we were able to reinvest after dividends an average of 8% of our equity over the last five years. The darker inflation-adjusted numbers indicate that book value in real terms did not grow at all.

This comparison points up the essence of the problem of inflation for a business entity: How can we finance both inflation and real growth and at the same time protect the shareholders' capital from erosion?

The fact is, inflation must be financed just as real growth must be financed. It is very difficult to achieve real growth in equity in a double-digit inflationary environment.

Fortunately, Borg-Warner has a strong equity base; and we have been able to use our resources more efficiently in the last five years through better working capital management and reallocation of capital to more productive areas.

For the last five years, we have been able to avoid an erosion of our shareholders' equity in real terms. We should point out that our book value is conservatively stated since our inventories at LIFO are \$195.5 million less than replacement cost, and our investment in the Hughes Tool Company was carried at a value \$150 million less than the market value at year-end.

The Borg-Warner market value comparison indicates that our share value increased in real terms at an average rate of 12.8% for each of the last five years. This, however, is from a very low value at the end of 1974, and is still less than the previous high of \$39.50 achieved in 1968.

We have also presented inflation-adjusted comparisons for capital expenditures and depreciation. Capital spending in real terms has grown only 1.4%, in line with real sales growth. Reported depreciation grew by 6.7%. However, constant dollar depreciation adjusted to 1979 dollars has been flat for the reporting period. During the recession period (1975-76), capital expenditures were less than depreciation expense in 1979 dollars because we did not replace our plants or equipment as fast as they were wearing out. That unhealthy situation has been corrected.

Net earnings adjusted for constant dollar depreciation have been estimated for each of the years shown. There is no question that historical cost depreciation understates the true economic cost of the wear and tear on assets that must be replaced at substantially higher future values, and our earnings are overstated to this extent. Since we pay federal income taxes on this overstatement, there is a loss of capital in real terms.



We have concluded that the key to coping with inflation in Borg-Warner is to improve our operating margins. The table on the bottom of page 21 shows the impact of changing prices on operating margins. It compares 1978 and 1979 for our manufacturing groups on a FIFO basis, a LIFO basis and a current cost basis which deducts replacement cost depreciation from the LIFO basis.

This comparison dramatically illustrates the erosion of margins caused by inflation. Since Borg-Warner values inventories worldwide on a LIFO basis, our segment figures in this report correspond with the center column. Note, however, that if we had clung to FIFO reporting, as some companies do, our overall operating margin would have been 2.5% higher in 1979.

Our reported operating margins did show a worrisome decline of 1.7% in 1979 from 1978. This decline is directly traceable to the fact that inflation in 1979 was the worst since 1974.

It is unfortunate that the impact of increased inflation is to decrease margins while the obvious goal of management to finance inflation and preserve capital is to increase margins.

Seeking to increase margins is not a new goal for Borg-Warner. The problem of inflation merely intensifies the need. We cannot afford to remain in product areas that tie up capital with little or no promise of generating margins required to finance inflation and real growth. We must continue to work diligently to reduce costs and improve productivity, and we must accelerate our efforts to combine our technology and proprietary know-how with market needs to bring new products and services to the market place.

During the last round of double-digit inflation in 1974, there was an upsurge of interest in accounting for inflation. I was convinced then that by the time the accountants came to some agreement on how to account for inflation, it would have ceased to be a problem.

I was mistaken. I grossly underestimated the degree to which the federal government could abort the curative process set in motion with the recession of 1974-75. In their frantic efforts to restore the economy to a growth mode, they set the stage for the current inflation, which is significantly more severe.

We think it is constructive to probe the various approaches to reporting inflation's impact on our business. Our research and study in this area already has contributed to a better understanding of the dynamics of inflation and its effect on our company.

Let us hope the full disclosure of the serious impact of inflation on the private enterprise system will strengthen the will of our leadership in Washington to stick with the fiscal and monetary restraints required to cool excess demand, dispel inflation psychology and restore confidence to our capital markets.



# Summary of accounting policies

The following paragraphs briefly describe the company's significant accounting policies. Certain amounts in the 1978 financial statements have been reclassified to conform to the 1979 presentation.

## Principles of consolidation

The consolidated financial statements include all subsidiaries except those in Mexico and South America, which are carried at cost due to political and economic uncertainty, and the financial and protective services companies. Investments in the financial and protective services companies and in affiliated companies, at least 20% owned by Borg-Warner, are carried at equity in underlying net assets.

## Marketable securities

Marketable securities are valued at cost, which approximates market.

## Inventories

Inventories are valued at the lower of cost or market. Cost of substantially all inventories worldwide is determined by the last-in, first-out (LIFO) method.

## Property, plant and equipment and depreciation

Property, plant and equipment is valued at cost less accumulated depreciation. Expenditures for maintenance, repairs and renewals of relatively minor items are generally charged to earnings as incurred. Renewals of significant items are capitalized.

Depreciation is computed generally on a straight-line basis over the estimated useful lives of related assets. For income tax purposes, accelerated methods of depreciation are generally used.

## Income taxes

For financial accounting purposes, investment tax credits are used to reduce income tax provisions over a seven-year period. For federal income tax purposes, investment tax credits are recognized currently.

Taxes have not been provided on undistributed net earnings of subsidiaries and affiliates to the extent these earnings are intended to be reinvested in those companies.

Deferred taxes have been provided on timing differences in reporting certain transactions for financial accounting and tax purposes.

## Earnings per share

Earnings per common share are based on average outstanding common shares and common share equivalents. Common share equivalents recognize the dilutive effects of common shares which may be issued in the future upon conversion of preferred stock and upon exercise of certain stock options.

## Retirement benefit plans

All eligible Borg-Warner domestic employees participate in non-contributory pension plans and substantially all non-U.S. employees participate in contributory or non-contributory pension plans. In addition, a number of employees are covered by non-contributory retirement benefit plans providing life insurance and medical benefits. The related expenses are based on independent actuarial valuations and substantially all are funded currently. Expenses include amortization of prior service costs over periods not exceeding 40 years.

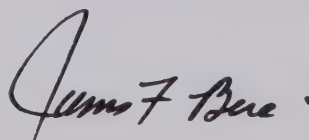
# Responsibility for financial statements

To our shareholders:


Borg-Warner Corporation has in place long-standing reporting guidelines and policies designed to ensure that the statements and other information in this report present a fair and accurate financial picture of the company. In fulfilling this responsibility, management must make informed judgments and estimates conforming with generally accepted accounting principles.

The company's comprehensive system of internal accounting controls provides reasonable assurance that assets are protected from improper use, that material errors are prevented or detected within a timely period, and that records are sufficient to produce reliable financial reports. Formal corporate policies demanding high standards of ethical and financial integrity are part of this system, which is subject to frequent review by an internal audit staff and the corporation's independent public accountants.

An Audit Committee composed entirely of Borg-Warner directors who are not employees of the company meets at least twice a year with the company's management and independent public accountants. They review financial results and procedures, internal financial controls and internal and external audit plans and recommendations. To guarantee independence, the Audit Committee and the independent public accountants have unrestricted access to each other with or without the presence of management representatives.



James F. Beré  
Chairman and  
Chief Executive Officer



James J. Gavin, Jr.  
Senior Vice President and  
Chief Financial Officer



# Statement of earnings

Borg-Warner Corporation and consolidated subsidiaries  
Year ended December 31

<b>Earnings</b>		<b>1979</b>	<b>1978</b>
		<i>(millions of dollars except per share data)</i>	
Sales and other income:			
Net sales		<b>\$2,717.4</b>	\$2,326.0
Other income		<b>18.4</b>	19.5
		<b>2,735.8</b>	2,345.5
Costs and expenses:			
Cost of sales		<b>2,133.8</b>	1,780.7
Depreciation		<b>59.6</b>	55.2
Selling, general and administrative expenses		<b>310.2</b>	276.1
Interest and other financial charges		<b>33.1</b>	26.7
Minority interests		<b>2.6</b>	3.0
Provision for income taxes		<b>68.2</b>	88.0
		<b>2,607.5</b>	2,229.7
Earnings from manufacturing operations		<b>128.3</b>	115.8
Earnings from financial services companies		<b>21.1</b>	16.1
Earnings from protective services companies		<b>6.2</b>	1.9
Net earnings		<b>\$ 155.6</b>	\$ 133.8
<b>Per common share</b>			
Net earnings		<b>\$ 7.25</b>	\$ 6.24

See accompanying summary of accounting policies and notes to financial statements.



# Balance sheet

Borg-Warner Corporation and consolidated subsidiaries  
December 31

<b>Assets</b>	<b>1979</b>	<b>1978</b>
	<i>(millions of dollars)</i>	
<b>Current assets:</b>		
Cash	\$ 28.9	\$ 37.3
Marketable securities	12.0	52.4
Receivables, less allowance for losses of \$18.5 million in 1979, \$15.7 million in 1978	357.8	296.2
Inventories	401.8	369.0
Other current assets	44.7	34.2
<b>Total current assets</b>	<b>845.2</b>	<b>789.1</b>
<b>Investments and advances, principally unconsolidated subsidiaries</b>	<b>393.9</b>	<b>351.5</b>
<b>Property, plant and equipment</b>	<b>556.0</b>	<b>493.7</b>
<b>Deferred charges less amortization</b>	<b>21.6</b>	<b>17.7</b>
	<b>\$1,816.7</b>	<b>\$1,652.0</b>
<b>Liabilities and shareholders' equity</b>		
<b>Current liabilities:</b>		
Notes payable	\$ 62.8	\$ 28.7
Accounts payable and accrued expenses	354.4	322.6
Income taxes	34.1	35.3
<b>Total current liabilities</b>	<b>451.3</b>	<b>386.6</b>
<b>Warranties and other liabilities</b>	<b>77.9</b>	<b>61.4</b>
<b>Deferred income</b>	<b>25.2</b>	<b>20.6</b>
<b>Deferred income taxes</b>	<b>11.3</b>	<b>33.2</b>
<b>Long-term debt</b>	<b>156.3</b>	<b>165.9</b>
<b>Minority shareholders' interest in consolidated subsidiaries</b>	<b>17.8</b>	<b>18.2</b>
<b>Shareholders' equity:</b>		
Capital stock:		
Preferred stock, liquidation preference \$15.7 million in 1979, \$21.2 million in 1978	1.0	1.3
Common stock	53.7	53.7
Capital in excess of par value	105.8	105.3
Retained earnings	935.5	827.3
	<b>1,096.0</b>	<b>987.6</b>
Less treasury common stock, at cost	19.1	21.5
<b>Total shareholders' equity</b>	<b>1,076.9</b>	<b>966.1</b>
	<b>\$1,816.7</b>	<b>\$1,652.0</b>

See accompanying summary of accounting policies and notes to financial statements.

# Statement of changes in financial position

Borg-Warner Corporation and consolidated subsidiaries  
Year ended December 31

<b>Operations</b>	<b>1979</b>	<b>1978</b>
	<i>(millions of dollars)</i>	
Earnings from manufacturing operations	\$ 128.3	\$115.8
Earnings from financial and protective services companies	27.3	18.0
Net earnings	155.6	133.8
Non-fund charges (credits) to earnings:		
Depreciation	59.6	55.2
Amortization of deferred charges	9.6	8.2
Earnings of financial and protective services companies reinvested	(20.4)	(12.2)
Other, net	(2.9)	5.1
<b>Total from earnings</b>	<b>201.5</b>	<b>190.1</b>
Funds provided by (used for) short-term assets and liabilities:		
Receivables	(61.6)	(37.1)
Inventories	(32.8)	(34.1)
Other current assets	(10.5)	(4.4)
Accounts payable and accrued expenses	31.8	62.4
Income taxes	(1.2)	3.8
	(74.3)	(9.4)
Funds provided by (used for) long-term assets and liabilities:		
Additions to deferred charges	(13.5)	(11.7)
Other	(11.7)	4.8
	(25.2)	(6.9)
<b>Net funds provided by operations</b>	<b>102.0</b>	<b>173.8</b>
<b>Dividends</b>		
<b>Dividends declared and paid</b>	<b>(43.8)</b>	<b>(39.3)</b>
<b>Investments</b>		
Capital expenditures	(130.7)	(115.3)
Disposal of property, plant and equipment	8.8	9.9
Net other (increase) decrease in investment and advances	(12.4)	8.9
<b>Net funds used in investments</b>	<b>(134.3)</b>	<b>(96.5)</b>
<b>Financing</b>		
Increase in notes payable	34.1	6.6
Long-term debt:		
Increases	11.9	44.5
Reductions	(21.5)	(27.8)
Common stock:		
Purchase of treasury common stock	(10.2)	(11.8)
Sales of treasury common stock	13.0	15.3
<b>Net funds provided by financing</b>	<b>27.3</b>	<b>26.8</b>
<b>Net increase (decrease) in cash and short-term securities</b>	<b>\$ (48.8)</b>	<b>\$ 64.8</b>

See accompanying summary of accounting policies and notes to financial statements.



# Notes to financial statements

## Operations outside the United States

Borg-Warner's equity in net earnings of consolidated subsidiaries located outside the U.S. was \$33.3 million in 1979 and \$23.9 million in 1978.

Borg-Warner's equity in the net assets of these companies at December 31 is summarized as follows:

(millions of dollars)	1979	1978
Current assets	\$325.7	\$290.9
Non-current assets	198.6	176.1
Total assets	524.3	467.0
Current liabilities	157.6	114.6
Non-current liabilities	110.8	106.6
Net assets before minority interests	255.9	245.8
Minority interests	17.8	18.2
Borg-Warner's equity in net assets	\$238.1	\$227.6

Consolidated net earnings for the years 1979 and 1978 include net foreign exchange credits of \$1.8 million and \$62 thousand, respectively.

Borg-Warner's equity in underlying net assets of its Mexican and South American subsidiaries at December 31, translated at exchange rates in effect at each year-end, exceeded the carrying value of these companies by \$10.2 million for 1979 and \$11.2 million for 1978. Dividends from these companies, which are included in earnings, amounted to \$700 thousand in 1979 and \$600 thousand in 1978.

## Inventories

Inventories are classified as follows at December 31:

(millions of dollars)	1979	1978
Raw material	\$ 96.4	\$ 86.1
Work in process	136.3	126.2
Finished goods	156.9	145.4
Supplies	12.2	11.3
Total inventories	\$401.8	\$369.0

Substantially all worldwide inventories are valued using the last-in, first-out (LIFO) method. Inventories, if valued at current cost would have been greater by \$195.5 million in 1979 and \$127.9 million in 1978.

## Property, plant and equipment

Following is a summary of Borg-Warner's property, plant and equipment at December 31:

(millions of dollars)	1979	1978
Land	\$ 12.9	\$ 11.7
Buildings	215.8	208.8
Machinery and equipment	467.4	443.7
Construction in progress	65.1	37.4
Capital leases	106.4	98.4
	867.6	800.0
Less accumulated depreciation	(311.6)	(306.3)
Net property, plant and equipment	\$556.0	\$493.7

## Long-term debt

Details of the company's long-term debt are as follows at December 31:

(millions of dollars)	1979	1978
Floating rate unsecured notes (at an average rate of approximately 17.0% at December 31, 1979 and 13.4% at December 31, 1978)	\$ 26.4	\$ 34.3
Unsecured note due 1982 through 1984 (at a rate of 7-5/8% at both December 31, 1979 and 1978)	30.0	30.0
5-1/2% sinking fund debentures due 1992	25.6	25.6
Unsecured notes (at an average rate of approximately 3.6% in 1979 and 4.5% in 1978)	0.8	1.2
Secured notes (at an average rate of approximately 7.1% in both 1979 and 1978)	3.2	3.6
Capital lease liability (at an average interest rate of 5.3% in 1979 and 6.2% in 1978)	70.3	71.2
Total long-term debt	\$156.3	\$165.9

Annual principal payments required as of December 31, 1979 in millions of dollars, are as follows:

1981	\$20.8	1983	\$20.7	1985,	\$ 5.2
1982	\$26.8	1984	\$22.6	after 1986	\$60.2

# Notes to financial statements

## Sales to major customers

Sales to Ford Motor Company were approximately 11% of consolidated sales in 1978. No other single customer accounted for more than 10% of consolidated sales in either 1979 or 1978.

## Industry segments

Borg-Warner manufacturing operations are classified among four principal industry segments: Air Conditioning, Chemicals & Plastics, Industrial Products, and Transportation Equipment. General corporate assets primarily include cash, marketable securities, and investments and advances. The nature of continuing operations within each segment is discussed in pages 4 through 12. Financial highlights for these segments are as follows for the years ended December 31, 1976 through 1979.

<b>Sales</b>				
<i>(millions of dollars)</i>				
	1979	1978	1977	1976‡
Air Conditioning	\$ 570.3	\$ 516.9	\$ 439.2	\$ 352.5
Chemicals & Plastics	595.4	472.1	421.8	399.1
Industrial Products	552.3	474.1	434.3	410.4
Transportation Equipment	986.5	844.5	718.5	652.4
Sales of segments	\$2,704.6	\$2,307.6	\$2,013.8	\$1,814.4
<b>Earnings</b>				
<i>(millions of dollars)</i>				
Air Conditioning	\$ 24.5	\$ 42.5	\$ 40.9	\$ 25.4
Chemicals & Plastics	56.6	43.4	24.1	37.0
Industrial Products	79.5	71.5	71.0	53.3
Transportation Equipment	81.9	89.2	71.9	64.5
Operating profit of segments	242.5	246.6	207.9	180.2
Financial Services	21.1*	16.1*	12.8*	10.6*
Protective Services	6.2*	1.9*		
Affiliates at equity	8.7	6.9	4.9	.8
General corporate expense	(22.7)	(24.1)	(25.4)	(17.9)
Interest expense	(33.1)	(26.7)	(25.8)	(26.0)
Earnings before taxes of continuing operations	\$ 222.7*	\$ 220.7*	\$ 174.4*	\$ 147.7*

\*Earnings for the financial and protective services companies are reflected on an after tax basis.

<b>Identifiable assets</b>				
<i>(millions of dollars)</i>				
Air Conditioning	\$ 257.0	\$ 226.7	\$ 198.7	\$ 184.3
Chemicals & Plastics	303.6	262.2	241.4	222.7
Industrial Products	314.0	281.0	242.9	222.5
Transportation Equipment	479.0	398.7	353.7	344.8
Identifiable assets of segments	1,353.6	1,168.6	1,036.7	974.3
Financial Services	156.5	134.4	115.7	104.8
Protective Services	125.1	121.7	112.0	
Affiliates at equity	41.3	34.3	29.3	23.7
General corporate assets	140.2	177.1	140.8	228.1
Identifiable assets of continuing operations	\$1,816.7	\$1,636.1	\$1,434.5	\$1,330.9

Capital expenditures and depreciation by industry segment are as follows for the years ended December 31, 1976 through 1979.

<b>Capital expenditures</b>				
<i>(millions of dollars)</i>				
	1979	1978	1977	1976‡
Air Conditioning	\$ 11.2	\$ 9.1	\$ 8.9	\$ 3.5
Chemicals & Plastics	33.0	46.9	22.5	6.6
Industrial Products	26.4	22.2	16.8	12.0
Transportation Equipment	54.2	30.7	23.0	12.9
Corporate	5.9	5.0	2.3	.6
Total	\$130.7	\$113.9	\$73.5	\$35.6
<b>Depreciation</b>				
<i>(millions of dollars)</i>				
Air Conditioning	\$ 6.4	\$ 6.2	\$ 5.5	\$ 4.9
Chemicals & Plastics	15.0	14.9	13.3	10.9
Industrial Products	11.3	10.0	9.8	7.5
Transportation Equipment	24.2	21.1	20.4	19.1
Corporate	2.7	2.2	1.3	.5
Total	\$59.6	\$54.4	\$50.3	\$42.9

## Geographic segments

Borg-Warner sales, operating profit, and identifiable assets by major geographic area are summarized as follows for the years ended December 31, 1976 through 1979.

<b>Sales unaffiliated customers</b>				
<i>(millions of dollars)</i>				
	1979	1978	1977	1976‡
United States	\$1,910.7	\$1,674.3	\$1,478.8	\$1,288.2
Australia	198.1	166.7	145.6	150.7
Canada	134.3	107.0	100.3	97.0
Europe	454.9	355.2	285.0	254.4
Other foreign	6.6	4.4	4.1	24.1
Total continuing operations	\$2,704.6	\$2,307.6	\$2,013.8	\$1,814.4
<b>Sales inter-segment</b>				
<i>(millions of dollars)</i>				
United States	\$80.9	\$65.7	\$57.6	\$54.7
Australia	1.2	.8	.3	.7
Canada	1.8	2.6	1.0	3.9
Europe	8.6	5.1	3.6	1.0
Other foreign	—	—	—	.1
Total continuing operations	\$92.5	\$74.2	\$62.5	\$60.4
<b>Operating profit</b>				
<i>(millions of dollars)</i>				
United States	\$194.7	\$195.9	\$179.8	\$148.8
Australia	18.7	19.6	17.6	17.1
Canada	12.5	11.0	7.5	10.4
Europe	15.5	20.3	3.0	5.3
Other foreign	1.1	(.2)	—	(1.4)
Total continuing operations	\$242.5	\$246.6	\$207.9	\$180.2
<b>Identifiable assets</b>				
<i>(millions of dollars)</i>				
United States	\$ 850.3	\$ 746.7	\$ 680.6	\$606.7
Australia	112.5	101.9	86.5	86.9
Canada	68.0	46.7	40.2	44.0
Europe	318.9	270.5	226.7	217.1
Other foreign	3.9	2.8	2.7	19.6
Total continuing operations	\$1,353.6	\$1,168.6	\$1,036.7	\$974.3

‡Data for 1976 is unaudited



# Notes to financial statements

## Stock options

Shareholders of Borg-Warner Corporation have approved stock option plans for officers and certain key employees. Outstanding options for the purchase of common shares, which expire at various dates through 1989, have been granted under these plans at prices ranging from \$17.94 to \$32.75 per share. These prices correspond to the market value of the stock on the dates the options were granted.

Officers and certain key employees of Baker Industries had been granted options to purchase shares of Baker common stock. As a result of the acquisition of Baker Industries by Borg-Warner, the options, which expire at various dates through 1985, were converted to options to purchase 69,565 shares of Borg-Warner common stock at prices ranging from \$7.92 to \$46.83.

A summary of changes in common shares under option for the years ended December 31, for all plans follows:

(dollars in millions)	Number of shares		Aggregate option price	
	1979	1978	1979	1978
Shares under option at January 1	922,065	824,400	\$23.3	\$20.7
Options granted	195,200	242,565	6.2	5.9
Cancellations	(23,375)	(42,700)	(.6)	(1.2)
Options exercised	(49,375)	(64,900)	(1.1)	(1.3)
Options exercised as stock incentive rights	(59,550)	(37,300)	(1.5)	(.8)
Shares under option at December 31	984,965	922,065	\$26.3	\$23.3
Options exercisable	642,325	599,200		
Shares available for future grants	186,600	381,800		

## Other income

Items included in other income consist of:

(millions of dollars)	1979	1978
Interest income	\$ 7.1	\$ 4.2
Dividend income	1.4	6.3
Gain on capital asset disposals	1.2	2.1
Equity in earnings of affiliated manufacturing companies, principally in Japan	8.7	6.9
Total	\$18.4	\$19.5

## Research and development costs

Total research and development cost charged to expense amounts to \$55.8 million in 1979 and \$49.1 million in 1978.

## Finance charges from related companies

Interest and other financial charges include finance charges paid to the financial services companies of \$12.2 million in 1979 and \$10.0 million in 1978 for accounts receivable financing.

## Income taxes

Provisions for taxes on income consist of:

(millions of dollars)	1979	1978
Current:		
Federal	\$81.7	\$85.7
State	4.8	9.4
Deferred	(14.8)	(3.9)
	71.7	91.2
Investment tax credits	3.5	3.2
Total	\$68.2	\$88.0

Non-U.S. taxes included in the provisions are \$16.7 million in 1979 and \$18.1 million in 1978.

The analysis of the variance from the U.S. statutory income tax rate for manufacturing operations follows:

	1979	1978
U.S. statutory rate	46.0%	48.0%
Increases (decreases) resulting from:		
Income (net) from non-U.S. sources	(.9)	(2.6)
United Kingdom inventory tax credits	(3.2)	—
Favorable tax settlement of prior years' disposed operations	(2.1)	—
Equity in earnings of affiliated companies	(2.9)	(1.2)
State taxes	1.3	2.5
DISC	(1.6)	(1.4)
Investment tax credit	(1.6)	(1.5)
Other, net	(.3)	(.6)
Effective income tax rate	34.7%	43.2%

The analysis of the deferred income tax provision representing the tax effects of timing differences between book and tax income follows:

(millions of dollars)	1979	1978
Excess of tax over book depreciation	\$ 6.8	\$ 6.4
Inventory reserves	(7.1)	(9.8)
Pension contribution	(4.8)	4.8
Reserve for plant closings	(3.2)	(1.2)
Other	(6.5)	(4.1)
Deferred income tax provision	\$(14.8)	\$(3.9)

The net amount of future tax benefits and deferred tax liabilities of \$13.5 million in 1979 and \$11.9 million in 1978 related to current items is included in other current assets, while the net amount related to non-current items is shown as a non-current liability.

Undistributed earnings of the company's DISC amounted to \$44.7 million at December 31, 1979 and \$37.7 million at December 31, 1978.

# Notes to financial statements

## Capital stock

Detail of capital stock is as follows at December 31:

(number of shares)	Authorized	Issued	In treasury
Preferred stock, no par value, \$4.50 cumulative convertible, Series A	5,000,000		
1979		157,439	-0-
1978		212,176	-0-
Common stock \$2.50 par value:	70,000,000		
1979		21,476,654	662,513
1978		21,476,654	773,351

The preferred stock has a stated value of \$6.25 a share and involuntary liquidation value of \$100 per share. Shares are convertible, at the holder's option, into 2-1/2 shares of common stock. In 1979, 41,438 preferred shares were converted to 103,591 common shares and in 1978, 51,493 preferred shares were converted to 128,715 common shares.

In 1979, 13,299 shares of the preferred stock were repurchased for \$1.1 million and in 1978, 12,633 shares were repurchased for \$900 thousand.

The company purchased 341,902 shares of common stock for the treasury in 1979 and 407,911 shares in 1978.

## Retained earnings

Retained earnings for the year ended December 31 are summarized as follows:

(millions of dollars)	1979	1978
Retained earnings at January 1	\$827.3	\$736.8
Net earnings	155.6	133.8
	982.9	870.6
Deductions from retained earnings:		
Dividends declared:		
Preferred stock (\$4.50 per share)	.9	1.2
Common stock (\$2.075 per share in 1979 and \$1.85 per share in 1978)	42.9	38.1
Excess of cost over stated value on retirement and conversion of preferred stock	3.6	4.0
	47.4	43.3
Retained earnings at December 31	\$935.5	\$827.3

## Capital in excess of par value

Capital in excess of par value for the years ended December 31 is summarized as follows:

(millions of dollars)	1979	1978
Capital in excess of par value at January 1	\$105.3	\$104.5
Net difference between cost and proceeds of shares issued under employee investment plans (283,161 shares in 1979 and 357,890 shares in 1978)	.6	.8
Excess of cost over proceeds on shares issued under stock option plans (49,375 shares in 1979 and 64,900 in 1978)	(.3)	(.4)
Excess of market price over cost on shares issued as stock incentive rights under stock option plans (16,563 shares in 1979 and 11,930 shares in 1978)	.1	.1
Tax benefits arising from exercise of non-qualified stock options	.1	.3
Excess of market price over cost on shares awarded to certain employees (50 shares in 1979 and 71 shares in 1978)	—	—
Capital in excess of par value at December 31	\$105.8	\$105.3

## Commitments

The company is committed to pay rents on non-cancellable leases with terms exceeding one year. Rental amounts committed in future years are summarized as follows:

(millions of dollars)	Operating leases	Capital leases	Total
1980	\$10.1	\$ 14.0	\$ 24.1
1981	7.6	12.7	20.3
1982	5.2	12.0	17.2
1983	3.7	10.8	14.5
1984	2.6	9.6	12.2
1985-89	2.7	27.8	30.5
1990-94	1.0	9.0	10.0
1995-1999	0.7	6.4	7.1
After 1999	0.6	4.3	4.9
Total	\$34.2	\$106.6	\$140.8

Total rental expense amounted to \$18.6 million in 1979 and \$14.1 million in 1978. Included in total rental expenses are charges paid to the financial services companies of \$2.6 million in 1979 and \$2.1 million in 1978. Future capital lease rental payments include executory costs of \$600 thousand, interest expenses of \$25.0 million and principal payments of \$81.0 million. The 1980 principal payments of \$10.7 million are included in notes payable.



# Notes to financial statements

## Retirement benefit plans

Retirement benefit expense amounted to \$56.5 million in 1979 and \$48.8 million in 1978.

The expense includes \$6.4 million for post-retirement life insurance and medical benefits in 1979 and \$5.1 million in 1978.

At December 31, certain defined benefit plans had accumulated vested benefits in excess of net assets and balance sheet accruals and others had net assets and balance sheet accruals in excess of accumulated vested benefits. A summary of benefit and asset values at December 31, 1979 and 1978 in millions of dollars follows:

	1979	1978
Plans with assets in excess of vested benefits		
Actuarial present value of accumulated benefits	\$152.5	\$ 7.6
Net assets available for benefits	157.5	10.1
Plans with vested benefits in excess of assets		
Actuarial present value of accumulated benefits	269.1	369.5
Net assets available for benefits	\$128.3	\$240.5

A significant portion of the increase in the actuarial present value of accumulated vested benefits at December 31, 1979 compared to December 31, 1978 results from the inclusion of supplemental allowances for certain plans in the current year. Previously, these supplemental allowances were treated on a pay-as-you-go basis and not actuarially computed.

In addition, an accrual calculated on an actuarial basis has been provided in warranties and other liabilities for post-retirement medical and life insurance benefits since 1974. A summary of benefit values and liabilities established at December 31, 1979 and 1978 in millions of dollars follows:

	1979	1978
Actuarial present value of post-retirement medical and life insurance benefits	\$ 55.7	\$ 51.7
Amount included in warranties and other liabilities	14.7	13.2

## Contingent liabilities

Borg-Warner Corporation has guaranteed \$100.0 million of receivables sold to its financial services companies at December 31, 1979 and \$96.6 million at December 31, 1978.

The company has also guaranteed borrowings of \$137.7 million of its financial services companies and \$20.8 million of other unconsolidated subsidiaries and affiliates at December 31, 1979. These guarantees were \$104 million and \$28.6 million respectively at December 31, 1978.

It is the opinion of management and counsel that various claims and litigation in which Borg-Warner is currently involved will not materially affect the company's financial position or earnings.

## Investment in Hughes Tool

In 1974 Borg-Warner acquired an equity interest in Hughes Tool in exchange for Byron-Jackson, Inc., a wholly owned oil well service company. The stock received was convertible preferred which if converted at December 31, 1979 would have represented a 16.3% interest in Hughes Tool common stock. On January 11, 1980 Borg-Warner converted the preferred shares to Hughes Tool common.

On February 8, 1980 Borg-Warner and Hughes Tool agreed to a transaction in which Hughes Tool would receive all stock of Centrilift, Inc., Borg-Warner's wholly owned oil well pump company, in exchange for 1.2 million shares of Hughes Tool common stock. The additional shares will increase Borg-Warner's voting interest in Hughes Tool to above 20% and will allow the company to use the equity method of accounting for the Hughes Tool investment in 1980.



Peat, Marwick, Mitchell & Co.

The Board of Directors and Shareholders  
Borg-Warner Corporation:

We have examined the balance sheet of Borg-Warner Corporation and consolidated subsidiaries as of December 31, 1979 and 1978, and the related statements of earnings and changes in financial position for the years then ended. Our examinations were made in accordance with generally accepted auditing standards, and accordingly included such tests of accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned financial statements present fairly the financial position of Borg-Warner Corporation and consolidated subsidiaries at December 31, 1979 and 1978, and the results of their operations and changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

*Peat, Marwick, Mitchell & Co.*

February 15, 1980

Certified Public Accountants

222 South Riverside Plaza  
Chicago, Illinois 60606

# Notes to financial statements

## Impact of changing prices (unaudited)

Management analysis of the impact of changing prices on the company is discussed on pages 20 - 23. The following supplemental information completes the disclosures required beginning in 1979 by the Financial Accounting Standards Board (FASB) Statement No. 33, "Financial Reporting and Changing Prices."

Reflected in the information is the effect of inflation on the reported results of the company using two different approaches as to adjusting property, plant and equipment for inflation. First, the effect of general inflation as determined by the Consumer Price Index (CPI) has been reflected as it relates to the depreciation of property, plant and equipment. Second, the effect of specific price changes on property, plant and equipment since initial purchase has been estimated and reflected in an adjusted depreciation amount based upon the "current cost" of the depreciable assets. The adjusted net earnings are not the result of a comprehensive restatement of earnings, but more simply reflect earnings as adjusted for the impact of changing prices on property, plant and equipment. No specific adjustment is disclosed for inventory as substantially all inventories are valued using the dollar value LIFO method which eliminates the impact of changing prices on inventory value from earnings.

## Income from manufacturing operations adjusted for changing prices

	Constant dollar earnings (adjusted for general inflation)	Current cost earnings (adjusted for specific price changes)
Net earnings manufacturing operations—as reported	\$128.3	\$128.3
Excess of constant dollar depreciation over historical cost depreciation	29.0	
Excess of current cost depreciation over historical cost depreciation		29.4
Adjusted earnings from manufacturing operations	\$99.3	\$98.9

## Unrealized gain (loss) from decline in purchasing power of net monetary assets owed or receivable

Consolidated manufacturing operations	Unconsolidated services operations	Total
\$30.6	\$(12.6)	\$18.0

## Effect of the increase in current cost on 12/31/79 ending balances

	Beginning of year current cost	Increase due to general inflation	Incremental amount due to change in specific prices	End of year current cost
Inventories	\$529.7	\$68.0	\$ (.4)	\$597.3
Fixed assets	\$755.1	\$96.6	\$(12.8)	\$838.9

## Interim financial information (unaudited)

The following information, in millions of dollars, includes all adjustments, consisting only of normal recur-

ring items, which the company considers necessary for a fair presentation of 1979 and 1978 quarterly results of operations.

	1979					1978				
	Quarter ended					Quarter ended				
	March 31	June 30	Sept. 30	Dec. 31	Year 1979	March 31	June 30	Sept. 30	Dec. 31	Year 1978
Net sales	\$631.5	\$709.2	\$660.5	\$716.2	\$2,717.4	\$525.7	\$608.5	\$572.1	\$619.7	\$2,326.0
Other income	4.2	4.6	3.8	5.8	18.4	3.2	2.4	4.5	9.4	19.5
	635.7	713.8	664.3	722.0	2,735.8	528.9	610.9	576.6	629.1	2,345.5
Cost of sales	493.7	551.4	527.7	561.0	2,133.8	406.7	461.3	439.0	473.7	1,780.7
Depreciation	13.3	14.5	13.9	17.9	59.6	12.9	14.1	13.0	15.2	55.2
Selling, general and administrative expenses	72.5	76.6	73.4	87.7	310.2	64.9	65.2	70.8	75.2	276.1
Interest and other financial charges	7.4	7.9	7.8	10.0	33.1	5.9	6.5	7.5	6.8	26.7
Minority interests	.6	.8	.7	.5	2.6	.3	.8	.6	1.3	3.0
Provision for income taxes	19.7	26.5	12.3	9.7	68.2	17.3	30.6	19.7	20.4	88.0
	607.2	677.7	635.8	686.8	2,607.5	508.0	578.5	550.6	592.6	2,229.7
Earnings from manufacturing operations	28.5	36.1	28.5	35.2	128.3	20.9	32.4	26.0	36.5	115.8
Net earnings from financial services companies	5.7	5.2	5.4	4.8	21.1	3.3	3.8	3.8	5.2	16.1
Net earnings from protective services companies	1.0	1.6	1.6	2.0	6.2	2.0	2.3	1.0	(3.4)	1.9
Net earnings	\$ 35.2	\$ 42.9	\$ 35.5	\$ 42.0	\$ 155.6	\$ 26.2	\$ 38.5	\$ 30.8	\$ 38.3	\$ 133.8
Net earnings per share	\$ 1.65	\$ 2.00	\$ 1.65	\$ 1.95	\$ 7.25	\$ 1.22	\$ 1.80	\$ 1.43	\$ 1.79	\$ 6.24



# Notes to financial statements

## Financial Services Companies

### Principles of combination

Borg-Warner's wholly owned financial services subsidiaries—Borg-Warner Acceptance Corporation and consolidated subsidiaries, Borg-Warner Equities Corporation, Centaur Insurance Companies, Creon Insurance Agency, Borg-Warner International - Puerto Rico and Borg-Warner Investments Corporation—have been combined in the balance sheet below.

### Combined balance sheet

December 31	1979	1978
	(millions of dollars)	
<b>Assets</b>		
Cash	\$ 18.6	\$ 15.0
Marketable securities	87.0	51.8
Finance receivables:		
Wholesale notes	832.9	640.7
Retail and direct notes	344.8	283.0
Leasing and commercial loans	469.2	342.4
Trade accounts	101.7	135.3
	1,748.6	1,401.4
Less allowance for losses of \$39.6 million in 1979 and \$30.8 million in 1978, and unearned finance charges	244.2	177.0
Finance receivables—net	1,504.4	1,224.4
Other assets, less allowance for losses of \$5.1 million in 1979 and \$4.5 million in 1978	153.9	111.1
	\$1,763.9	\$1,402.3
<b>Liabilities and shareholder's equity</b>		
Short-term notes payable	\$ 961.5	\$ 737.7
Outstanding checks and other liabilities	232.1	158.1
Long-term debt:		
Senior debt	266.4	230.2
Senior subordinated debt	98.4	90.9
Junior subordinated debt	49.0	51.0
Shareholder's equity:		
Capital stock	23.1	23.1
Paid-in capital from Borg-Warner Corporation	40.6	35.1
Retained earnings	92.8	76.2
Total shareholder's equity	156.5	134.4
	\$1,763.9	\$1,402.3

### Summary of earnings

Comparative earnings for the financial services companies for the years ended December 31, are summarized below:

Years ended December 31	1979	1978
	(millions of dollars)	
Total finance income	\$271.1	\$210.7
Costs and expenses:		
Operating expenses	77.4	63.8
Provision for credit and insurance losses	38.9	40.3
Interest expense	120.8	79.1
Provision for income taxes	12.9	11.4
Total costs and expenses	250.0	194.6
Net earnings	\$ 21.1	\$ 16.1

### Finance receivables

Includes trade accounts receivable, commercial loans and lease receivables of \$169.6 million in 1979 and \$128 million in 1978 related to transactions with Borg-Warner.

In 1979 and 1978 finance receivables also include \$27.9 million and \$29.7 million, respectively, of commercial loans made by Borg-Warner Equities Corporation to real estate joint ventures in which Borg-Warner Equities Corporation has an equity interest.

### Long-term debt

The long-term debt bears interest and matures as follows: senior—7.0% to 13.6% (weighted average: 1979, 9.9%; 1978, 9.0%), due 1980-1993; senior subordinated—7.8% to 16.5% (weighted average: 1979, 9.7%; 1978, 9.2%), due 1982-1998; junior subordinated—8.8% to 9.6% (weighted average: 1979, 9.3%; 1978, 9.3%), due 1980-1998.

The senior and senior subordinated long-term debt are stated net of debentures acquired and submitted to the trustees to meet future sinking fund requirements. Gains realized on the acquisition of the debentures have been netted against interest expense. The aggregate amounts of long-term debt maturities for the five years ended December 31, 1984 in millions of dollars are as follows: 1980, \$22.3; 1981, \$134.0; 1982, \$12.2; 1983, \$10.2; 1984, \$53.6.

### Retained earnings

At December 31, 1979, under provisions of certain long-term debt agreements, approximately \$13.7 million of retained earnings was available for the payment of dividends or purchase of Borg-Warner Acceptance Corporation's capital stock.

In 1979 and 1978, the financial services companies declared dividends of \$4.5 million and \$3 million, respectively.

The cost of certain marketable equity securities has been reduced to market value by establishment of a valuation allowance with a balance of \$700 thousand at both December 31, 1979 and 1978; the allowance was increased by \$300 thousand in 1978 with an offsetting entry to retained earnings.

# Notes to financial statements

## Protective Services Companies

### Basis of consolidation

The summarized financial statements below include the accounts of Baker Industries and its wholly owned subsidiaries.

On December 20, 1979, the company acquired Burns Electronics Security Services, Inc. The acquisition has been reflected in the December 31, 1979 balance sheet.

### Consolidated balance sheet

December 31	1979	1978
	<i>(millions of dollars)</i>	
<b>Assets</b>		
Current Assets	\$ 68.7	\$ 60.2
Property, plant and equipment	87.5	61.8
Excess of purchase price over fair value of tangible assets acquired	64.4	68.0
Other assets and deferred charges	3.0	4.5
	<b>\$223.6</b>	<b>\$194.5</b>
<b>Liabilities and shareholder's equity</b>		
Current liabilities	\$ 47.2	\$ 52.3
Long-term debt	41.1	14.2
Deferred income taxes	5.2	2.6
Deferred income—subscriber's installations	5.0	3.7
Shareholder's equity	125.1	121.7
	<b>\$223.6</b>	<b>\$194.5</b>

### Statement of consolidated earnings

Years ended December 31	1979	1978
	<i>(millions of dollars)</i>	
<b>Income:</b>		
Sales and service revenue	\$234.8	\$208.8
Other income	1.3	0.8
Total income	236.1	209.6
<b>Costs and expenses:</b>		
Cost of sales and services rendered	163.3	147.2
Selling, general and administrative expenses	48.5	45.9
Depreciation	9.5	7.8
Interest expense	3.8	2.6
Total costs and expenses	225.1	203.5
Earnings before provision for facility closing and related expenses and income taxes	11.0	6.1
Provision for facility closing and related expenses		2.3
Earnings before income taxes	11.0	3.8
Income taxes	4.8	1.9
Net earnings	\$ 6.2	\$ 1.9

### Retained earnings

In 1979 and 1978, Baker Industries paid dividends of \$2.8 million.

## Property, plant and equipment

<i>(millions of dollars)</i>	1979	1978
Land	\$ 1.8	\$ 1.3
Buildings	6.6	5.1
Machinery and equipment	18.6	12.4
Armored service vehicles	7.4	4.9
Central station equipment	5.4	3.5
Subscribers' installations	64.5	41.9
Less accumulated depreciation	(16.8)	(7.3)
Net property, plant and equipment	<b>\$87.5</b>	<b>\$61.8</b>

### Long-term debt

The composition of long-term debt is as follows:

<i>(millions of dollars)</i>	1979	1978
Notes payable to Borg-Warner and subsidiaries	\$ 32.5	\$ 10.1
Capitalized lease obligations	5.4	5.8
Mortgage notes and sundry indebtedness	6.3	1.1
	<b>44.2</b>	<b>17.0</b>
Less current installments	3.1	2.8
Total	<b>\$41.1</b>	<b>\$14.2</b>

The aggregate maturities of long-term debt in millions of dollars are \$3.1 in 1980, \$1.8 in 1981, \$.8 in 1982, \$.3 in 1983 and \$.2 in 1984. Notes payable to Borg-Warner Investment Corporation of \$32.5 million are repayable in fifteen equal annual installments beginning in 1986.

### Revenue recognition

Service revenues are recorded in income as they are earned. Installation fees charged to Alarm division subscribers and related selling expenses applicable to the procurement of new contracts are deferred and reflected in income over five years (the period of most initial service contracts).

### Amortization of intangible assets

Identifiable intangible assets are being amortized over their respective lives. Unidentifiable intangible assets arising principally from the acquisition by Borg-Warner of Baker Industries are being amortized over a period of 40 years.

### Provision for facility closing and related items

In 1978 the company provided approximately \$5.8 million for costs associated with the consolidation of its residential smoke alarm production. These costs included facility closing expenses, an estimated loss on the sale of the facility, inventory losses and costs of cancelling purchase commitments. During 1979, a portion of this provision was utilized. Uncertainties continue in the residential smoke alarm market, but the company believes that the remaining provision is adequate to cover potential losses.



## Quarterly data

<b>Sales</b>	Quarter	1979	1978	1977	1976	1975	1974
		<i>(millions of dollars except per share data)</i>					
	First	\$ 631.5	\$ 525.7	\$ 469.7	\$ 432.9	\$ 380.2	\$ 395.7
	Second	709.2	608.5	517.6	491.4	431.5	471.3
	Third	660.5	572.1	498.4	461.2	404.0	462.0
	Fourth	716.2	619.7	546.2	476.9	423.3	438.8
	Year	\$2,717.4	\$2,326.0	\$2,031.9	\$1,862.4	\$1,639.0	\$1,767.8
<b>Net earnings</b>							
	First	\$ 35.2	\$ 26.2	\$ 19.4	\$17.0	\$ 3.8	\$13.1
	Second	42.9	38.5	28.6	24.5	11.6	17.9
	Third	35.5	30.8	24.5	18.5	12.6	11.7
	Fourth	42.0	38.3	31.5	21.7	16.5	8.1
	Year	\$155.6	\$133.8	\$104.0	\$81.7	\$44.5	\$50.8
<b>Per share Earnings</b>							
	First	\$1.65	\$1.22	\$ .95	\$ .88	\$ .20	\$ .68
	Second	2.00	1.80	1.35	1.26	.60	.94
	Third	1.65	1.43	1.15	.95	.66	.62
	Fourth	1.95	1.79	1.48	1.12	.85	.42
	Year	\$7.25	\$6.24	\$4.93	\$4.21	\$2.31	\$2.66

<b>Stock price</b>			<b>Cash dividends</b>	
	High	Low	Payment date	Per share
1st Quarter '78	\$28	\$25-3/8	February 15, 1978	\$.45
2nd Quarter '78	33	27-1/2	May 15, 1978	.45
3rd Quarter '78	34-3/8	27-3/4	August 15, 1978	.45
4th Quarter '78	34-1/8	26	November 15, 1978	.50
1st Quarter '79	29-5/8	26-3/4	February 15, 1979	.50
2nd Quarter '79	32	27-3/8	May 15, 1979	.50
3rd Quarter '79	34-1/2	30-1/2	August 15, 1979	.50
4th Quarter '79	37-1/4	30	November 15, 1979	.57-1/2

# Management's discussion and analysis of the summary of earnings and financial position

In 1979, net sales were \$2.7 billion, a 17% increase from 1978 sales of \$2.3 billion. Net income of \$156 million (\$7.25 per share) in 1979 represents a 16% increase over 1978 net income of \$134 million (\$6.24 per share). The 1978 sales were 14% above the 1977 level while 1978 net income was 29% over the \$104 million (\$4.93 per share) earned in 1977.

The summary of earnings for the years 1975 through 1979 is included in the eleven-year comparative financial summary on pages 38 and 39 of this annual report. The accompanying operating and financial review on pages 2 through 14 provides additional information regarding the company's operations and financial performance.

## Manufacturing Operations

Chemicals and Plastics sales increased 26% from 1978 reflecting improvements worldwide with especially strong performance in Europe. The Transportation Equipment group sales increased 17% in both 1979 and 1978. All business areas within the group reflected increases from 1978 with the most significant improvement coming from the non-passenger vehicle and off-highway areas. 1979 Air Conditioning sales increased 10% from 1978, and 1978 sales were 18% over the 1977 level due to new and expanded product lines which minimize energy consumption.

Other income, which includes dividends from unconsolidated subsidiaries and other investments, earnings from affiliated companies and interest, was down 6% in 1979. A breakdown of this item is on page 30. The increase in interest income is due principally to increased earnings rates on investments in short-term securities. This increase, coupled with improved earnings from affiliated companies, was not sufficient to offset the decline in dividend income. Other income in 1978 was up 5% from 1977 with increased dividend income and equity in earnings of affiliates more than offsetting the decline in interest income resulting from lower investment in short-term securities.

The 20% increase in cost of sales in 1979 outpaced the increase in sales. This is a direct result of inflation's impact. With substantially all inventories valued using the last-in, first-out (LIFO) method, the current recognition of higher costs reduced 1979 earnings \$33.4 million (\$1.56 per share) as compared to \$14.0 million (\$.66 per share) in 1978 and \$8.8 million (\$.42 per share) in 1977.

Research and development expenditures increased to \$56 million in 1979 compared with 1978 expenditures of \$49 million and 1977 expenditures of \$45 million. These increases reflect the expansion of the company's research efforts. Depreciation increased 8% in 1979 and 1978 over the respective previous year.

Total debt including capitalized leases increased during 1979 to \$219 million at year-end, from \$195 million at December 31, 1978. Interest expense and other financial charges increased 24% in 1979 to \$33 million from \$27 million in 1978 reflecting increased short-term borrowing rates.

The provision for income taxes in 1979 was 35% of earnings from manufacturing operations, compared with an effective tax rate of 43% in 1978 and 44% in 1977. The lower rate resulted primarily from a 2% reduction in U. S. corporate taxes, tax credits on inventories related to our U. K. operations and favorable tax settlements in cases involving operations disposed of in prior years.

All manufacturing groups showed an increase in earnings in 1979 with the exception of Air Conditioning. This group was affected by an out-of-balance product mix, reduced orders for automobile compressors and dramatic copper price increases.

Sales by Borg-Warner consolidated units outside the U. S. were \$794 million, up 25% from \$633 million in 1978. This follows the 1978 increase of 18% over the 1977 sales level. Net earnings from these units were \$33 million in 1979, compared with \$24 million in 1978 and \$5 million in 1977. Both the increased sales and improved earnings reflect continued improved economic conditions in the geographic areas in which we operate.

## Services Earnings

Earnings from the Financials Services companies increased 31% in 1979, following a 26% increase in 1978. Contributing to the improvement in both years were higher inventory financing volumes, increased commercial financing income and increased net investment income from insurance companies.

Protective Services companies contributed \$6 million in 1979 as compared to \$2 million in 1978. The poor 1978 performance was due to a depressed residential smoke detector market and provisions to close one of two plants manufacturing these products. Protective Services had no impact on 1977 results since the acquisition of Baker Industries, Inc. was treated as a purchase effective at the close of business, December 31, 1977.

## Financial Position

Borg-Warner's current ratio decreased to 1.87 to 1 in 1979 from 2.04 to 1 in 1978. Valuing inventories under the last-in, first-out (LIFO) method is the cause for this decline. Had inventories been valued at current cost, this ratio would have been 2.31 to 1 in 1979 and 2.37 to 1 in 1978.

The debt to equity ratio increased slightly to 20.3% in 1979 compared to 20.1% in 1978, indicating the company's ability to internally finance the majority of its increased capital spending program in 1979.



# Eleven-year comparative summary of earnings and related statistics

Earnings	Year ended December 31	1979	1978
		<i>(millions of dollars except per share data)</i>	
	Sales and other income:		
	Net sales	\$2,717.4	\$2,326.0
	Other income	18.4	19.5
		2,735.8	2,345.5
	Costs and expenses:		
	Cost of sales	2,133.8	1,780.7
	Depreciation	59.6	55.2
	Selling, general and administrative expenses	310.2	276.1
	Interest and other financial charges	33.1	26.7
	Minority interests	2.6	3.0
	Provision for income taxes	68.2	88.0
		2,607.5	2,229.7
	Earnings from manufacturing operations	128.3	115.8
	Earnings from financial services companies	21.1	16.1
	Earnings from protective service companies	6.2	1.9
	Net earnings	\$ 155.6	\$ 133.8
Per common share	Net earnings	\$ 7.25	\$ 6.24

See accompanying management discussion and analysis of the summary of earnings on page 37.

Operating data	Year ended December 31	1979	1978
		<i>(millions of dollars except per share data)</i>	
	Return on net sales	5.7%	5.8%
	Return on sales from manufacturing operations	4.7	5.0
	Dividends	\$ 43.8	\$ 39.3
	Per common share paid	2.075	1.85
	Capital expenditures	130.7	115.3
	Research and development expense	55.8	49.1

Financial data	December 31	1979	1978
		<i>(millions of dollars except per share data)</i>	
	Current assets	\$ 845.2	\$ 789.1
	Current liabilities	451.3	386.6
	Net working capital	393.9	402.5
	Current ratio	1.87 to 1	2.04 to 1
	Property, plant and equipment, net	556.0	493.7
	Notes payable and long-term debt	219.1	194.6
	Debt to equity ratio	20.3%	20.1%
	Shareholders' equity	1,076.9	966.1
	Return on average equity	15.2%	14.6%
	Book value per common share	50.99	45.64
Other data	<i>(thousands)</i>		
	Average number of common shares outstanding	21,445	21,416
	Number of shareholders at year end	53.6	55.9
	Average number of employees	55.4	47.0

\*Includes net expense of \$20.5 million, or \$1.07 per share of common stock, resulting from accounting changes, principally to reflect the cost of substantially all domestic inventories at LIFO (last-in, first-out).

1977	1976	1975	1974	1973	1972	1971	1970	1969
\$2,031.9	\$1,862.4	\$1,639.0	\$1,767.8	\$1,546.8	\$1,283.2	\$1,148.2	\$1,114.8	\$1,087.0
17.4	19.1	14.3	6.3	5.6	4.7	4.6	9.0	3.3
2,049.3	1,881.5	1,653.3	1,774.1	1,552.4	1,287.9	1,152.8	1,123.8	1,090.3
1,554.8	1,440.2	1,308.2	1,419.9	1,179.8	973.0	885.4	858.2	825.6
50.9	43.4	42.8	43.1	40.5	37.3	34.7	33.0	30.8
252.6	231.3	206.4	206.3	182.3	153.5	131.8	134.9	123.7
25.8	26.0	36.4	38.1	21.7	17.1	17.4	19.6	11.7
2.6	2.7	2.1	2.0	2.0	1.2	.9	1.3	.6
71.4	66.8	21.0	21.9	61.6	52.8	40.2	37.0	48.3
1,958.1	1,810.4	1,616.9	1,731.3	1,487.9	1,234.9	1,110.4	1,084.0	1,040.7
91.2	71.1	36.4	42.8	64.5	53.0	42.4	39.8	49.6
12.8	10.6	8.1	8.0	6.8	6.2	5.0	3.7	2.4
—	—	—	—	—	—	—	—	—
\$ 104.0	\$ 81.7	\$ 44.5	\$ 50.8*	\$ 71.3	\$ 59.5**	\$ 47.4	\$ 31.8‡	\$ 52.0
\$ 4.93	\$ 4.21	\$ 2.31	\$ 2.66*	\$ 3.70	\$ 3.03**	\$ 2.45	\$ 1.65‡	\$ 2.65

1977	1976	1975	1974	1973	1972	1971	1970	1969
5.1%	4.4%	2.7%	2.9%*	4.6%	4.6%**	4.1%	2.9%‡	4.8%
4.5	3.8	2.2	2.4*	4.2	4.1**	3.7	3.6‡	4.6
\$ 34.5	\$ 27.5	\$ 26.4	\$ 26.1	\$ 26.4	\$ 24.6	\$ 24.5	\$ 18.5	\$ 24.8
1.65	1.41	1.35	1.35	1.35	1.25	1.25	1.25	1.25
77.0	36.0	55.9	83.0	69.6	62.8	55.2	69.7	51.5
45.3	44.2	42.2	42.2	41.2	42.7	39.2	40.0	39.1

1977	1976	1975	1974	1973	1972	1971	1970	1969
\$ 648.7	\$ 688.5	\$ 589.5	\$ 687.5	\$ 641.9	\$ 528.3	\$ 502.1	\$ 522.1	\$ 536.5
315.5	318.6	243.5	264.2	291.4	188.0	168.7	195.0	220.8
333.2	369.9	346.0	423.3	350.5	340.3	333.4	327.1	315.7
2.06 to 1	2.16 to 1	2.42 to 1	2.60 to 1	2.20 to 1	2.81 to 1	2.98 to 1	2.68 to 1	2.43 to 1
443.5	423.6	397.6	412.8	400.8	377.8	364.8	350.6	320.9
171.3	206.1	180.9	301.5	214.6	174.3	183.2	206.8	207.9
19.6%	27.8%	26.3%	45.0%	33.4%	28.6%	31.9%	37.4%	38.2%
872.2	742.3	689.1	670.0	642.4	610.4	574.9	553.1	543.8
12.9%	11.4%	6.6%	7.7%*	11.4%	10.0%**	8.4%	5.8%‡	9.8%
41.10	38.36	35.51	34.63	33.47	30.93	29.40	28.20	27.49
21,093	19,414	19,266	19,107	19,272	19,640	19,329	19,318	19,623
57.0	58.6	63.3	63.7	61.6	60.8	64.3	67.0	65.7
38.9	38.9	39.6	46.5	46.3	42.9	41.4	43.4	41.6

\*\*After extraordinary items, net of income tax, of \$260 thousand or one cent per share of common stock.

‡ After extraordinary items, net of income tax, of \$11.7 million or 60 cents per share of common stock.



---

# Officers

---

## Robert O. Bass

Vice Chairman  
46 years service

## James F. Beré

Chairman and  
Chief Executive Officer  
19 years service

## Donald W. Collier

Senior Vice President  
Corporate Strategy  
19 years service

## Jerry E. Dempsey

President and  
Chief Operating Officer\*  
24 years service

## James R. Deters

Vice President and  
Controller  
10 years service

## James J. Gavin, Jr.

Senior Vice President  
Finance  
11 years service

## Clarence E. Johnson

Vice President  
Human Resources  
27 years service

## Frederic C. Kautz

Assistant Treasurer  
14 years service

## Robert E. LaRoche

Vice President  
(Financial and  
Protective Services)  
24 years service

## James R. Lidman

Assistant Secretary  
13 years service

## Robert A. Morris

Vice President  
Communications  
3 years service

## Mark F. Ogan

Assistant Treasurer  
10 years service

## Russell J. Parsons

Senior Vice President,  
General Counsel and  
Secretary  
33 years service

## Frank E. Pilling

Vice President  
(Transportation  
Equipment)  
30 years service

## Elmer D. Robinson

Executive Vice President  
(Air Conditioning,  
Industrial Products)  
24 years service

## John P. Rozinsky

Assistant Controller  
14 years service

## Jeannette E. Terris

Assistant Secretary  
31 years service

## Donald C. Trauscht

Vice President  
Business Development  
and Acquisitions  
12 years service

## William M. Valiant

Vice President  
and Treasurer  
32 years service

## Peter C. Valli

Vice President  
(Energy Equipment)  
21 years service

## William H. Weltyk

Vice President  
Engineering and  
Development  
20 years service

## Jack L. Wentz

Assistant Secretary  
17 years service

## Management Committees

### Policy and Planning Committee

James F. Beré, Chairman  
Robert O. Bass  
Donald W. Collier  
Jerry E. Dempsey  
James J. Gavin, Jr.  
Clarence E. Johnson  
Russell J. Parsons  
Elmer D. Robinson

### Operations Committee

\*Jerry E. Dempsey, Chairman  
James R. Deters  
Leonard A. Harvey  
Robert E. LaRoche  
Frank E. Pilling  
Elmer D. Robinson  
Peter C. Valli

\*Elected to post on 1/8/80.

---

# Directors

---

## Hans Bacher

Member, Board of Management  
Robert Bosch GmbH  
Stuttgart, West Germany  
Director since 1977

## Robert O. Bass

Vice Chairman  
Borg-Warner Corporation  
Director since 1973

## James F. Beré

Chairman and Chief Executive Officer  
Borg-Warner Corporation  
Director since 1968

## Weston R. Christopherson

President and Chief Executive Officer  
Jewel Companies, Inc.  
Chicago, Illinois  
Director since 1973

## Jerry E. Dempsey

President and Chief  
Operating Officer  
Borg-Warner Corporation  
(Elected a director in Jan. 1980)

## Gaylord Donnelley

Chairman of the Executive Committee  
R. R. Donnelley & Sons Company  
Chicago, Illinois  
Director since 1966

## Gaylord Freeman

Honorary Chairman  
First Chicago Corporation and  
The First National Bank of Chicago  
Director since 1957

## James J. Gavin, Jr.

Senior Vice President—Finance  
Borg-Warner Corporation  
Director since 1969

## William B. Graham

Chairman and Chief Executive Officer  
Baxter Travenol Laboratories, Inc.  
Deerfield, Illinois  
Director since 1971

## Raymond M. Holliday

Chairman of the Board  
Hughes Tool Company  
Houston, Texas  
Director since 1975

## Robert S. Ingersoll

Deputy Chairman, Board of Trustees  
The University of Chicago  
Director since 1976 and 1955-72

## William G. Karnes

Retired Chairman of the Board  
Beatrice Foods Co.  
Chicago, Illinois  
Director since 1959

## Hans L. Merkle

Chairman of the Board of Management  
Robert Bosch GmbH  
Stuttgart, West Germany  
Director since 1977

## James J. O'Connor

President  
Commonwealth Edison Company  
Chicago, Illinois  
Director since 1978

## James E. Olson

Vice Chairman of the Board  
American Telephone &  
Telegraph Company  
New York, New York  
Director since 1974

## Thomas C. Theobald

Executive Vice President  
Citibank, N.A.  
New York, New York  
Director since 1977

## Committees of the Board

### Executive Committee

James F. Beré, Chairman  
Robert O. Bass  
James J. Gavin, Jr.  
William B. Graham  
William G. Karnes

### Compensation Committee

Gaylord Freeman, Chairman  
James E. Olson, Vice Chairman  
Weston R. Christopherson  
Gaylord Donnelley

### Finance Committee

William G. Karnes, Chairman  
William B. Graham  
Raymond M. Holliday  
Robert S. Ingersoll  
James J. O'Connor  
Thomas C. Theobald

### Audit Committee

Weston R. Christopherson, Chairman  
Gaylord Donnelley  
Robert S. Ingersoll  
James J. O'Connor

### Nominating Committee

William B. Graham, Chairman  
Weston R. Christopherson  
James E. Olson  
Thomas C. Theobald

# The businesses of Borg-Warner

Originally rooted in the auto industry, Borg-Warner now is a diversified manufacturing company involved in eight markets basic to the world's economy: transportation, construction, consumer products, machinery, agribusiness, energy, and financial and protective services.

Our products largely are durable goods. Few reach individual consumers with our name on them. More often, they are components in products made by others.

Millions of telephones, for example, are molded of Borg-Warner's Cylolac® ABS thermoplastic. Thousands of motorists drive cars equipped with Borg-Warner transmissions, while hundreds of the world's large buildings are cooled with equipment from York®.

Borg-Warner has some 50 major divisions with operations in 20 countries on 6 continents. These operating units are organized into five product and service groups based on similarity of products or technology, and not necessarily the markets served. The five groups are:

## Air Conditioning

The York division is a major manufacturer of engineered air conditioning systems for large buildings and industrial refrigeration equipment for the petrochemicals, food and other process industries. It also produces commercial air conditioning equipment for smaller office buildings, schools, hotels, factories and apartment buildings.

A growing part of York's business is residential air conditioning systems, heat pumps and furnaces. In addition, it makes automotive air conditioning compressors.

## Chemicals and Plastics

Cylolac brand ABS is the trade name for a wide range of tough, engineering thermoplastics produced and marketed around the world by Borg-Warner Chemicals. In addition, the group manufactures and markets a full line of Blendex® impact modifiers used for upgrading the physical properties and processing characteristics of PVC and other plastics.

Borg-Warner Chemicals also is in the fine chemicals business with a growing line of intermediates, additives and alkylphenols. The group produces styrene monomers for Cylolac ABS and for sale on the open market.

## Financial and Protective Services

The 1977 acquisition of Baker Industries, with its well-known Wells Fargo protective services units, brings added excitement to this group. Baker's six divisions provide the broadest range of protective services and products in the security field.

Borg-Warner Acceptance Corporation remains the group's major services unit. Today, it offers these financial services: wholesale, retail and receivables financing; consumer financing; credit life, disability and property insurance; and vehicle and equipment leasing.

## Industrial Products

This is the most diversified of the five product and service areas. Major products of this group are: centrifugal pumps for power plants, pipelines and water plants; precision seals for pumps and compressors; valves; chains, bearings and power transmission products.

Other products include: agricultural discs, hospital furniture and audio-visual educational systems.

## Transportation Equipment

As the leading independent producer of automatic transmissions, the group supplies automatics to major car and light-truck manufacturers outside the U.S. The company's five-speed manual transmission with overdrive was the first mass-produced in the U.S.

In addition to transmissions, other components include: clutches, four-wheel-drive units, spin-resistant differentials, axle assemblies, locking hubs for four-wheel-drive vehicles, propeller shafts, carburetion and ignition equipment, radiators and other heat exchangers.

Borg-Warner also supplies replacement parts for passenger cars, trucks, off-highway and farm equipment, boats, aircraft, recreational vehicles and industrial machines.

## Information and publications

The following publications can be obtained by writing: Director of Investor Relations, Borg-Warner Corp., 200 S. Michigan Ave., Chicago, IL 60604.

---

Form 10-K Annual Report to the Securities and Exchange Commission

---

Investor Fact Book

---

The First Fifty Years (History of the company)

---

Information Directory (Listing products and facilities)

---

Description of principal pension plan

For answers to questions about shareholder accounts, dividends and dividend reinvestment, contact shareholder representative Dorothy Flynn at the address above, or phone 312-322-8563.

Transfer agents/registrars for Borg-Warner stock:

---

The Continental Illinois National Bank and Trust, Chicago

---

Citibank, N.A., New York

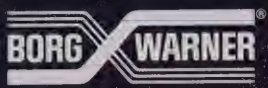
The annual meeting of shareholders will take place on Tuesday, April 22, beginning at 9:30 a.m. in the First Chicago Center at Dearborn and Madison Streets.

## Dial 800-621-5445 for Borg-Warner NEWS

You can get a quick, recorded update on recent Borg-Warner news developments by calling 800-621-5445. There is no charge to you for "800" line calls.

If you live in Illinois, phone 312-322-8600.





**Borg-Warner Corporation**  
200 South Michigan Avenue  
Chicago, Illinois 60604

# The Business of Borg-Warner

AR31





*It is the business of Borg-Warner...*









*...to help the builder make our great cities and  
our individual homes more comfortable...*









*...to help the farmer grow two kernels  
where only one grew before...*







*...to help the traveler get where he must go,  
swiftly and safely...*





...and to facilitate a score of other fields of human endeavor.

In fact, wherever a vehicle moves, or machinery turns, or fuels are produced, or electricity is generated, or structures are cooled or warmed, or foods are processed, or tools are used, or conveniences and luxuries are purchased, or property is protected, the chances are, Borg-Warner is involved.

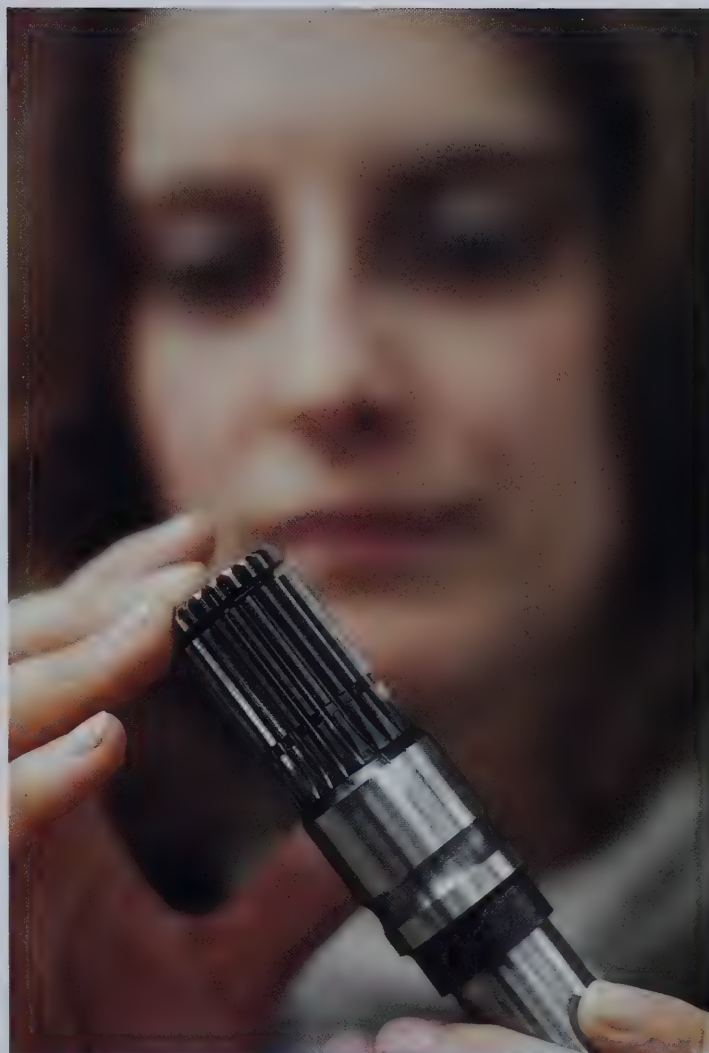
Borg-Warner is a company of some 50,000 persons, encompassing a wide range of skills and professions, working in 20 different countries to provide goods and services that are essential to the functioning of a modern society.

The things we make are used by or affect millions of people. Yet, paradoxically, few persons have ever seen a Borg-Warner label directly. Many of our trade names—BWAC, Ingersoll, Byron Jackson Pump, Morse, Rockford, Warner Gear, Wells Fargo, York—are better known than that of the parent company.

Regardless of brand name, only a few of our products and services are what we call end items—finished entities, complete in themselves. Most of the things we make are invisible to consumers. Some are smaller than a human thumb, some taller than a three-story building. They may be made of an alphabet of metals from aluminum to zirconium, or of other materials from abrasives to paper and plastic. Most often, they go to other companies to be incorporated into *their* products or systems.

The sun gear that Borg-Warner research engineer Lisa Giesecke is holding (inset picture) is a case in point. It's part of a relatively new automatic transmission being produced by a Borg-Warner joint venture company in Japan. Few motorists will ever see such a part, but without it, transmissions wouldn't work, and cars wouldn't run.

So much of our work is like that—essential but invisible



—that we've decided to blow our own horn a little, and call your attention to some of it.

But what we want to talk about isn't just ourselves. It's the way our business connects with the world outside our plant gates; about the major markets we serve, and especially the *people* whose individual needs form these markets in the first place.

The one market that Borg-Warner participates in more than any other, our traditional home base, is transportation—the business of moving people and things. Nearly half our annual sales are of transportation-related equipment.

Next biggest for us is the construction market, where about one-sixth of our sales originate. The remainder of our manufacturing sales are divided about evenly among the industries that extract and produce energy, and the makers of consumer goods, machinery, and agricultural and food-handling equipment.

Besides these businesses, Borg-Warner takes part in two

service industries—financial and protective security services—which currently provide around 15 per cent of our yearly earnings.

In the pages that follow, you will meet some of the people who end up using these often “invisible” products and services, and a few of the Borg-Warner employees who provide them.

We're proud of these employees, because they work so hard to make things hardly anybody notices the best of their kind available. We're happy, too, to be associated with these end-users, even though most of them didn't know us until we asked to take their pictures.

It's not their business to think about us.

But thinking about them is the very first business of Borg-Warner. □



# Transportation: strength in the drive train for a world on wheels—our basic market

The road stretching ahead may be the premier symbol of modern life. Our civilization is built around the automotive—literally the “self-propelled”—vehicle: the personal car, the delivery truck, the over-the-road rig, the motorcycle, the bus, the forklift, the recreational vehicle, the earth-mover, the power boat. For Americans, particularly, mobility has long been one of the strongest characteristics. That is becoming increasingly true for the entire world.

The complex of industries serving this need represents Western society's largest single area of economic activity. The

transportation “market”—not counting such associated system essentials as roads and fuels—totals hundreds of billions of dollars annually. Borg-Warner was created a half century ago to serve this market—and it is still the largest of our “businesses.”

All manufacturers of automobiles—and of most larger and smaller vehicles—in the United States, and in many other countries, use at least one Borg-Warner part. Some use dozens.

Our products can be found throughout a vehicle. In the





grilles and other decorative touches that make a specific brand distinctive. In the engine's cooling system, radiators and related equipment. In emission control devices to reduce environmental problems. In air conditioning for passenger comfort.

But our greatest strength is in designing and producing the components of the automotive drive train.

Basically a vehicle today is still what one has been for centuries—a wheeled container to carry persons or cargo. But instead of animals for motive power, the self-propelled vehicle carries its own internal power source. To make the vehicle move, however, the power generated by the engine has to be transmitted through a complex series of components—collectively a drive train—to make wheels turn.

The drive train includes such items as clutches, gears, transmissions, torque converters, drive shafts, universal joints, differentials, and axles.

Nobody makes these parts better than Borg-Warner. The basic concepts apply to any vehicle powered by an internal combustion engine, so we make them in dozens, sometimes hundreds, of variations of size and configuration to meet the particular needs of any sort of vehicle.

Right now, the automotive industry is going through what may be its most dramatic, and most rapid, period of change. World conditions and attitudes are forcing new requirements in fuel conservation, in environmental considerations and in safety.

Keeping up with, and if possible ahead of, the new needs is a major part of our job. Our customers are vehicle makers *and* vehicle users, and we try to work for the best interests of both.

We know that cars will have to be smaller, lighter, more efficient. We are working to improve every part we make to meet those goals. In fact, one of Borg-Warner's greatest









## Task of our time: save energy, but keep the people in motion

strengths has always been the ability to solve specific problems—and then to apply that solution in all the broad areas in which we work.

One expert recently described the probable average car of one decade hence as “four cylinder, turbo-charged, front-wheel drive.” Well, maybe. It might be something different, too. Borg-Warner is exploring many paths within our own areas of expertise.

In some cases, the size of a component is being reduced while maintaining, or even increasing, its efficiency.

In others, new kinds of components will reduce fuel consumption.

Take a look at one of the new breeds.

Driving is, for most persons, easier with an automatic transmission. A manual transmission, however, is more fuel efficient when driven properly.

The problem: how does one *both* retain the convenience of the automatic and approach the fuel economy of the manual?

The answer: the “lock-up” torque converter.

This new kind of component is based on product technologies that Borg-Warner knows well. We are the leading independent producer of both automatic and manual transmissions. We are also major makers of clutches (which go with manuals) and torque converters (which go with automatics).

Clutches and torque converters are coupling devices—that is, each joins two rotating shafts, turning at different speeds, in a way that transfers the desired turning speed quickly and smoothly from one shaft to the other.

A clutch does this by bringing together plates faced with a friction material, locking them firmly together. With a torque converter, the turning power from the engine shaft is transmitted by an impeller to a hydraulic fluid; the swirling of the fluid against a turbine face brings the second shaft up to almost the same speed.

Almost, but not quite. When clutch plates engage, they “slip” just enough to make the connection without jar, then lock. In the hydraulic fluid medium, the “slip” is continual; about seven per cent of the torque efficiency is lost as a result. This doesn’t matter much while gears are shifting; but once in the cruise mode, there is a steady measurable energy loss.

The answer was to add a locking device to the torque converter.

Once the automatic system has done its basic job of getting up to cruising speed, it “locks-up,” eliminating the fluid slippage and consequent energy loss during sustained highway driving. When the car must slow down or stop, the lock-up disengages in a fraction of a second.

It wasn’t as simple as it sounds—special springs, seals, stampings and valves had to be designed into what amounts to a whole new system. But the fuel savings have been verified.

*Ken Farmer of Pisgah, Ala., personally specified all major components for his “Special K” flagship of a seven-truck fleet that hauls the produce of his Racoon Mountain Sorghum Syrup Company coast to coast. He chose our new Rockford® fan drive clutch because it saves fuel, cuts maintenance, lowers noise, and keeps engine horsepower in the engine—which will help in the 200-mile truck race he plans to enter soon.*

A modulated fan drive attacks another fuel-saving problem for trucks and off-the-road vehicles.

Water cooled engines use a fan, turning behind the radiator, to help cool the circulating water. In a passenger car, the energy drain for the fan is negligible. But in big vehicles, as much as eight per cent of engine power may be needed just to keep a big fan turning constantly. Our engineers found that when a truck is barrelling down the highway, the air rammed through the radiator by the vehicle’s own movement is more than enough to keep the engine at proper operating temperature.

So we came up with a device that controls the speed of the fan, not wasting energy when it’s not needed. Sensors read the temperature of the engine’s coolant directly, and turn on the fan if the heat rises. The average long-haul truck is expected to do at least 200,000 miles every year—and that



*John Dickson of Gainesville, Fla. shows off his one-ski style while enjoying the benefits of Borg-Warner’s marine transportation work. We make hydraulic transmissions and water-lubricated bearings used by some of the leading manufacturers of power boats.*

burns up a lot of fuel. Even a four or five per cent saving adds up to a lot of gallons.

Like so many solutions after they are found, this one sounds almost elementary—yet it required not only a concept, but special techniques, skills and materials. Oil-bathed clutch faces, for instance, that clamp tight when necessary—but when the system is “off,” slip continuously in such a way that, even though contact is never entirely lost, friction does not wear away the facing material.

The major way to save fuel, however, is simply to make cars lighter, so ultimately the car must get smaller. That’s leading to a revolution in automobiles; some experts predict



## Will tomorrow's car be four-cylinder, turbocharged and front-wheel drive?

that within a decade, most cars will be powered by front wheel drive. Putting all the mechanism up front permits greater design flexibility for the passenger compartment and the overall vehicle.

Front wheel drive will not eliminate any of the components needed in the drive train; in fact, it may increase the number. Weight will be reduced, however, by eliminating the heavy rear axle and the drive shaft. Most components will have to be redesigned for new configurations.

Our Hy-Vo® chain, which is strong, light, flexible, and can transfer energy at high velocity and very quietly, has already replaced gears in some large cars which use front-wheel drive. It has even greater potential for the coming



At a press conference in Detroit, Larry Swanson (left) and Dave McEwan demonstrate a new application for a special formulation of Cycloc ABS—wheel covers one-sixth the weight of conventional metal models.

*The "transfer case" that Roger Groskopf, a project manager at our Ithaca, N.Y., plant, is demonstrating contains Borg-Warner's Hy-Vo® chain, one of the most efficient of power transfer devices for front- and four-wheel drive vehicles. This case was designed for a 9-ton, front-wheel drive motor home.*

wave of smaller cars.

Plastic offers another avenue to weight reduction. Over the past 20 years, our Cycloc® ABS, a tough, durable engineering thermoplastic available in a wide range of grades, has increasingly replaced heavier metals.

For example, most automobile grilles today are made of ABS. Borg-Warner developed a grade of its Cycloc ABS that was the first plastic that could be chrome-plated easily and effectively, retain the high impact quality and easy moldability needed—and be much lighter than the zinc that had been generally used for grilles earlier.

On the dashboard under the windshield, the "greenhouse effect" caused by the sun can raise temperatures to as high as 220° F—enough to buckle metals and soften other plastics. The solution was to make instrument panels of a high-heat grade of Cycloc ABS that retains dimensional stability at high temperature.

And one of the newest applications of Cycloc ABS is chrome-plated wheel covers made of a grade that can be molded into interesting shapes, resists corrosive environmental conditions, retains strength against impact—and weighs less than the metals previously used.

Still, driver convenience will remain a major buyer consideration—so we work at improving the comfort factors, too.

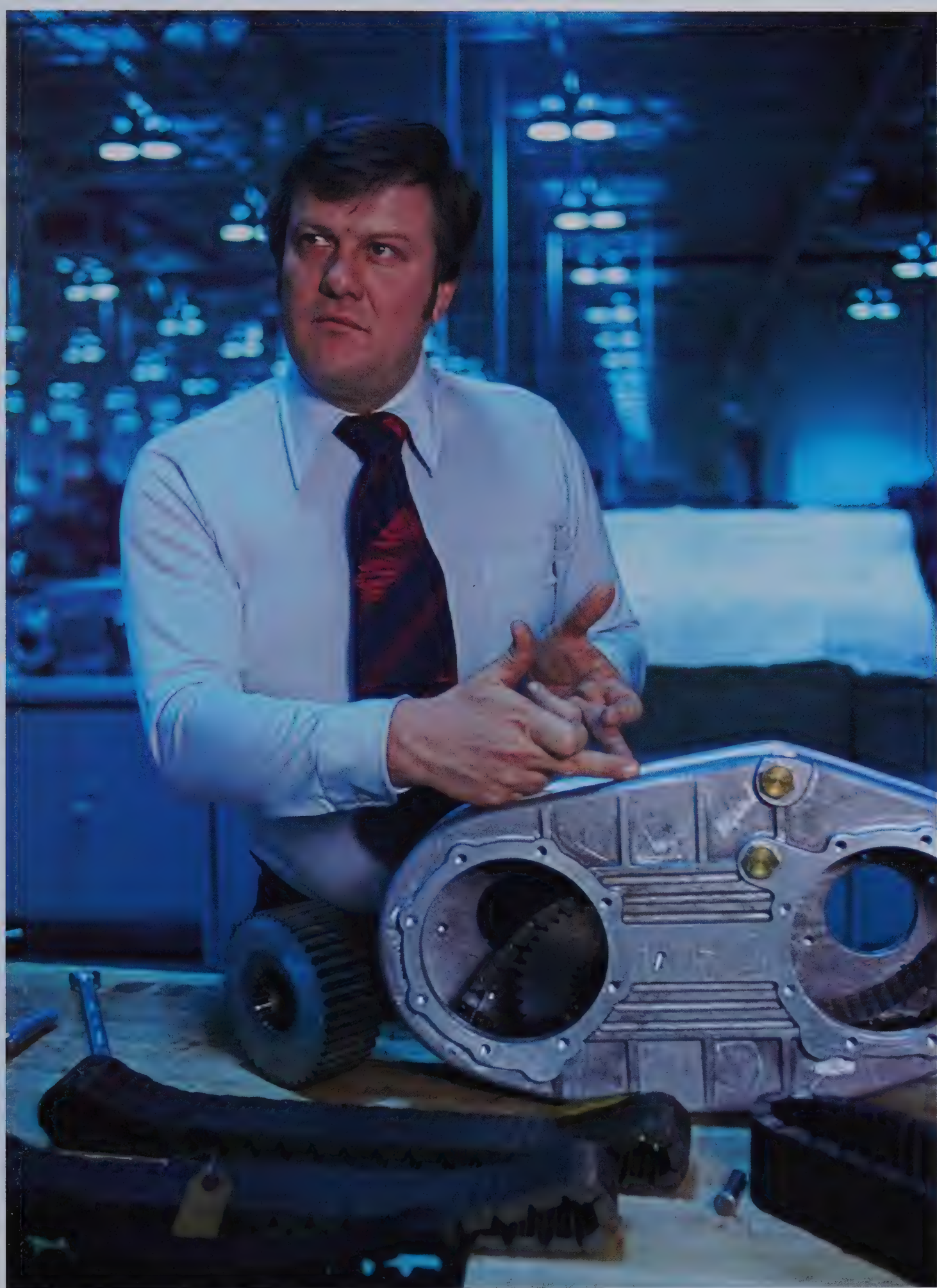
When Borg-Warner started to make York® automotive air conditioning compressors in the late fifties, only about one per cent of American cars had cooling systems installed. In the latest year, more than 90 per cent of all U.S.-made automobiles—and a lot of trucks and other vehicles—were air-conditioned.

Although they've been steadily improved, the principle of reciprocating pistons has been basic in the 30 million automotive compressors we've delivered to date. Now we are introducing a new rotary compressor that uses rotating vanes inside a cylinder to compress the refrigerant. The technique reduces noise and vibration. More important, the rotary takes up 20 per cent less space in a configuration that fits better into smaller engine compartments—and still offers greater cool-



Will a new York compressor move refrigerant properly in a car driving fast under baking desert sun? Gordon Pinchott finds out by simulating all those conditions at once in our Decatur, Ill., environmental chamber.







## Accidents do happen; for every part we make, a replacement is available

ing capacity than the larger reciprocating types.

New regulations affect what we make, too—such as valves, switches, solenoids and other control devices, many of them related to emission control. One example is our EGR (Exhaust Gas Recirculating) valve, which itself requires a complex of other switches and valves.

To help reduce the level of one possible pollutant, nitrous oxide, within the cylinder, the EGR feeds precise amounts of exhaust gases back into the cylinder. This reduces the temperature of combustion below the point at which nitrous oxides are formed.

While we are working on new devices, old standbys are hardly being ignored.

For instance, Borg-Warner has been the leading maker of timing chains for generations. A timing chain connects the crankshaft with the camshaft to control the opening and closing of the valves of the cylinders to insure proper combustion. It is a vital part of just about every V-8 and most V-6s.

But even in this application, weight is a factor. Now we

also make timing *belts* for smaller engines. The fiber-reinforced, neoprene-type rubber belts operate on the same principle as the chains. Despite the difference in material, their teeth and their stretch control must be just as accurate. Although their production is in some ways more difficult, they do save a few pounds compared with metal.

Four-wheel drive utility vehicles—bigger than a car, smaller than a truck, are becoming more important in the automotive world. They are able to go almost anywhere, offering better control on snow and ice, sand, or other difficult conditions. Over the past decade, annual sales of such vehicles has increased almost tenfold.

Borg-Warner makes transfer cases for both “full-time” four-wheel drive systems—in which power is fed continuously to both axles to drive all four wheels—and for “part-time” systems in which one pair of wheels can be engaged as driving conditions require.

When a vehicle with a full-time system is driven on a hard-surfaced highway, the added friction increases fuel consumption. Wheel-locking hubs which could be disengaged as necessary have long been available. Our most recent contribution, however, is an advanced design automatic wheel-



*A constant-velocity joint assembly must transmit motion through a variable angle. Senior technician George Hughes, at Borg-Warner's test laboratory in Pontiac, Mich., is measuring part of the prototype of a new model.*





locking hub which can be engaged or disengaged by the driver without leaving his seat.

No matter how well made, moving parts do wear out, accidents happen, and components must be replaced. The "aftermarket," the supply of parts for repair and replacement, grows every year with the number of cars on the road.

Borg-Warner's automotive parts operation is responsible for making available to the replacement market every automotive part that Borg-Warner makes, whether for passenger cars or heavy duty vehicles. The line of 15,000 different "part numbers" maintained in seven regional distribution centers includes major Borg-Warner specialties like clutches, along with ignition kits, carburetor kits, fuel pumps, emission control devices, gears, timing chains and many other items that might be needed.

Most of the parts are for models eight years old or younger. But Borg-Warner warehousemen boast that in a pinch they might even find some parts for a Studebaker or a Nash.

As technology changes, the number of parts that must be stocked keeps growing. Although appearance of a car used to change every year, many of the parts remained identical

for a decade. Today, parts change much more rapidly to meet new requirements for weight reduction, fuel economy and environmental protection. And since both front wheel and rear drive vehicles will be being made simultaneously for many years to come, many of the same basic parts have to be stocked in an enormous range of additional shapes and sizes.

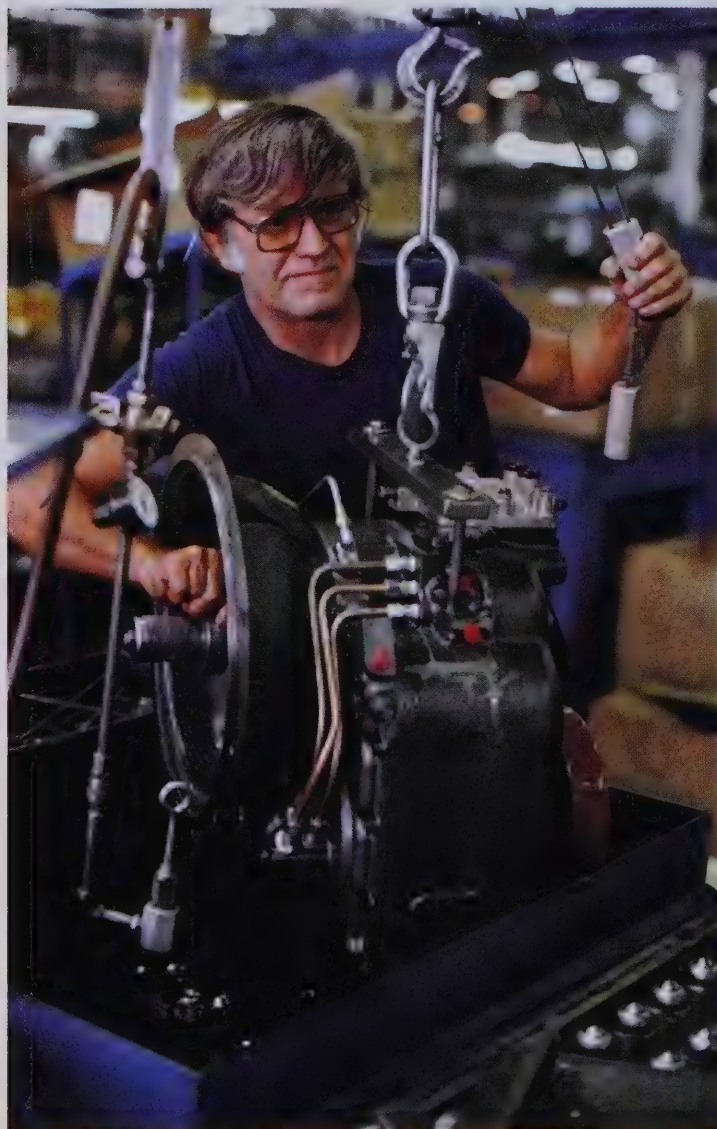
These items are handled by some 21,000 jobber organizations throughout the United States. They in turn sell to the many thousands of service stations and repair shops, and increasingly to "walk-ins," individuals who maintain their own cars. □

*In 1947, when Sam Payseur (left) opened his repair garage in Shelby, N.C., there were only 33 million motor vehicles on American roads. Today that number is 130 million—offering plenty of opportunity for Borg-Warner's automotive replacement parts. Here, Borg-Warner ignition components are being installed by Tommy Doster (right), who now runs the garage.*





*Birtsel Hodson of Muncie, Ind., assembles Borg-Warner's T22—a two-speed, automatic, heavy-duty industrial transmission for construction equipment, some of which was involved in building the Chicago hotel you see going up at right.*



## **Construction: power parts and comfort systems for society's endless renewal**

Population grows; obsolescence and additional needs continually call for more new structures of all kinds. Good times or bad, building never stops.

Where construction is in progress, the odds are high that Borg-Warner is involved. We're there in the equipment used to prepare the site and raise the structure; in the specialty plastic pipe used for drains and venting; and most of all, Borg-Warner is there when the building is done, providing for the comfort of its occupants.

Production of power transfer components for massive construction machinery is one of the businesses of Borg-Warner. Construction equipment is among the most complicated of self-powered vehicles.

The biggest of trucks has only one essential function—to pull a load straight down a highway. The construction machine, earth mover or backhoe or crane, must be able to



travel to its work site by road—and then do its job on the roughest of terrain, often perched at strange angles, moving backwards or forwards, up and down, inches or feet at a time, to maneuver varieties of loads and stay in perfect balance.

Much of that versatility is made possible by the heavy-duty transmissions, clutches, control valves, energy transfer and hydraulic devices that we make specifically for construction equipment.

But Borg-Warner's biggest contribution to modern construction by far is in something that two generations ago was a luxury—and today is so much a part of life that it has changed the economics and geopolitics of nations.

Borg-Warner is one of the world's leading producers of air conditioning, under the York® label.

The first theatre was "air-cooled" as early as 1914, in Mobile, Ala., and the first office building was completely





air-conditioned in 1923, in Fresno, Calif., both with York equipment. Still, as recently as a quarter century ago, although new office buildings were being air-conditioned, few existing ones were. Room coolers were appearing in homes, but central air conditioning was still the prerogative of the upper economic classes. An air-conditioned automobile was rare enough to be a conversation piece. What is now the "booming Sunbelt" was then still the "sultry, sleepy South," and stories about Houston and Atlanta ran more to mildew and scorpions than legends of commercial growth.

By now, however, a whole generation has grown up that has never known a life without air conditioning. No structure that involves the public could be built without it today in most of the western world. In about half the private homes being built in the United States, central systems are being installed as original equipment.

But air conditioning depends on the availability of energy—which will be scarcer and more expensive. The job of a producer like Borg-Warner, therefore, is making the equipment more efficient, so that air conditioning remains available even in an energy-short world.

Air conditioning systems come in many sizes and shapes, but are all based on the same principles. Heat always flows toward cold. A circulating "refrigerant"—any of several gases or liquids that have the capacity to absorb heat—is pumped through a series of coils. After the colder refrigerant absorbs interior heat, a compressor adds pressure and moves it to an exchange system outdoors. There it releases heat to the relatively cooler external air.

It's not quite that simple, of course. Condensing coils and evaporators, finned heat exchange surfaces and other devices are all used at various points to help squeeze the heat out of



## Some of the best-known buildings are kept cool by York equipment

the refrigerant so it can go back and pick up more.

Borg-Warner's York systems fall into three general categories:

- Self-contained systems, ready for connection to ductwork, for homes and smaller commercial and industrial buildings.
- Giant water chillers and air-handling units that are the heart of the systems that cool many of the world's biggest and most prestigious structures.
- Heat pumps, newest of all, which can either warm or cool homes or smaller commercial structures at the touch of a button—cooling conventionally, but actually extracting heat from cold outdoor winter air.

The self-contained units include all the major compo-

last as long as the building itself.

Instead of absorbing heat from air, in water chillers a refrigerant (most commonly a fluorocarbon) removes heat from water, dropping its temperature to about 44°F. The cold water, piped throughout the building, becomes a second refrigerant.

At designated spots—every room in a hotel, or at strategic locations in the large open areas of an airport terminal—the chilled water will pass through air-handling units. In these localized heat-transfer units, the cold water absorbs the heat from the room or area, and fans blow the cooled air back.

The circulating water warms gradually to about 54°F before being returned to the chillers to repeat the cycle.

Scores of the world's most prestigious buildings—from the United Nations complex in Geneva, to the Superdome in New Orleans—along with large numbers of lesser known buildings, are kept comfortable by such York equipment.



*At our York, Pa. facilities, James Mitchell brazes a header assembly for a large air handling unit.*

nents, packaged within a single container, or possibly in two connected modules for adding to an existing structure.

They go to new homes, where central air conditioning is being installed during original construction, and to older homes that are finally being centrally cooled. They are even more likely to appear in large shopping centers, medium-sized office buildings, and small factories.

These packaged air conditioners come in capacities as small as 1½ tons to as high as 100 tons. (A ton of cooling is equivalent to melting one ton of ice in one hour.) A fair-sized enclosed shopping mall might use a mixture of a dozen medium-to-large packaged units—a factory as many as 50.

Although the units are packaged, they do not come off the shelf. We design most of them for a specific need—even to prefabricating the curbs of the container so the package will fit neatly into a particular space.

More elaborate systems are built into such huge edifices as the twin towers of the New York World Trade Center, which uses enough cooling for about 18,000 homes, and into thousands of other commercial or public buildings that may be only a tenth or even a hundredth that size.

For these systems we produce the two basic elements: giant water chillers that supply the main refrigeration for the structure, and the "air-handling units" that provide the active cooling and circulation in specific rooms and areas. The items we make are custom designed for each structure and built to



The requirement on a single system can be illustrated by the 604,000 square foot new East Building of the National Gallery of Art in Washington. Fine art must be kept at constant temperature and humidity; fluctuations might crack the canvas, wood and paints of the masters.

In the new gallery, glass walls and enormous skylights create a tremendous heat gain (the main skylight alone contains over a third of an acre of glass, 80 feet above the main concourse). In some galleries, large numbers of visitors tend to raise temperatures. In other cases, high density lighting does it. The system of chillers and air handlers had to be designed to keep the art safe and the people comfortable at all times.

The prestige jobs attract notice, but the majority of our engineered systems go into smaller structures, averaging about 125,000 square feet. Until energy became a problem, size was the prime consideration in an air conditioning sys-

tem. Now efficiency is. Through the combined talents of consulting engineers, insulation specialists and others, cooling requirements for new buildings have been cut sharply; the efficiency of air conditioning systems alone has been improved by up to 20 per cent over the past five years.

But of all the new developments, the heat pump is the most exciting.

Basically, a heat pump is a reversible air conditioner. In summer, it cools an interior conventionally. In winter, by reversing the refrigerant flow, it absorbs heat from the outside

*Students from Burgundy Farm Day School in Alexandria, Va., relax as a lecturer explains a modern sculpture exhibit in the new East Building of the National Gallery of Art in Washington, D.C. The gallery's temperature and humidity are held constant by York® equipment.*











## Heat pumps are now competitive even in extreme climates, as fuel costs soar

air and brings it inside. Surprisingly, heat generated by the sun's energy is still present even at freezing temperatures.

The concept is not really new—commercial heat pumps were available a generation ago. In an earlier day of cheap fossil fuels, however, other systems cost less to install and operate. Besides, atmospheric conditions could sometimes trick electro-mechanical controls, cause a system to turn on cooling instead of heat on a freezing day.

Control problems have been solved in our York heat pumps with new electronic devices that cannot be fooled by environmental tricks. And as the cost of fossil fuels continues to rise, the economics of the heat pump have become more obvious. Over the past five years, the number of heat pumps installed annually has increased almost five-fold.

Initially, heat pumps were most successful economically in moderate temperature zones which have few extremes of temperature, hot or cold. Recently, heat pumps have become competitive even in sunbelt states like Florida, or in areas like Minnesota, with its severe winters, as the prices of oil, gas and electricity for conventional systems climb. The system is operated by electricity; but for every unit of electricity it uses

*The Middle East construction boom has drawn heavily on our air conditioning and refrigeration business. Here, Christian Landon (left) and Alain Moreau, draftsmen at our plant in Nantes, France, check the work on a pair of custom designed refrigeration units bound for an ice skating rink being built in Kuwait.*

to operate, it can pick up as many as three units of "free" heat from the outside air.

The heat pump can also tap some unorthodox sources. Most underground bodies of water maintain a constant temperature, cooler than the air in summer, warmer in winter. A high school in Kansas sits atop a large aquifer with a steady temperature of 60°. In winter, a heat pump transfers the water's heat to warm the school—and in summer, heat thrown off by the air conditioning goes back to the water. A homeowner with a well can often do the same thing.

Other applications continue to grow. Greenhouses, for example, need even temperatures. Without supplemental heating and cooling, and constant surveillance, they can get too hot during the day, too cold at night. A heat pump solves the problem. During the day, it takes excess heat out of the greenhouse, "stores" it in a heat sink such as a pool of water or brine, and reverses at night to put the heat back. □

*In Creil, north of Paris, neighborhood footballers take time out for a team portrait. The 4000 flats of the public housing project they live in are warmed in winter by a unique York heat pump system, designed for the French government by our engineers there. It saves energy and operating costs, keeping the rents low, by drawing its heat from hot springs 1000 feet below ground.*





*Jim Philp is one of the engineers building Units 2 and 3 at the San Onofre nuclear station, which will add 2.2 million kilowatts of generating capacity to the Southern California grid. Crucial to these operations will be four 9700 hp Byron Jackson primary coolant pumps in each unit.*



## **Energy: turning it on so the world can work; our job—make fluids flow**

We know that when we flick a switch, the lights will go on. We know that fuels are generally available to move our vehicles, warm our homes, power our factories.

But we don't often stop to realize that energy must be *produced* before it is available for use. Electricity must be generated by steam-driven turbines before it enters the power grid that leads to our homes. Fossil fuels must be brought out of the earth, refined and transported.

Borg-Warner plays a key part in these complex procedures. All aspects of the production of energy require, in some part, the movement of fluids—of boiling water and steam in the creation of electricity, of oils, gases and even slurried coal

in the production and processing of fossil fuels.

Moving these fluids requires large numbers of pumps, seals, valves. Borg-Warner is a leading producer of the kinds used by petroleum-related industries and for electricity generation.

Our Byron Jackson brand pumps are a far cry from the old hand-levered kind at the back door. The "centrifugal" pumps in which we specialize range in capacity up to 750,000 gallons per minute, moving fluids at temperatures up to 2,200°F, and at pressures as high as 5,000 pounds per square inch.

A centrifugal pump is the most effective means for moving a fluid to meet a wide range of pressure and flow requirements. This is done basically by a shaft-driven, vaned impeller rotating in a pump casing. The more impellers used in a single pump, the greater the fluid velocity or pressure.

We build centrifugal pumps in many configurations and sizes, each designed for a specific purpose.

In a typical fossil-fuel power plant, for instance, a variety of sizes may be required to serve the total system.





*Chicago at nightfall. Big cities fairly throb with the energy they consume. Borg-Warner is involved in both supplying and conserving it.*

*On a huge boring mill, the suction bell of a Byron Jackson vertical circulator pump is machined at our Vernon, Calif., plant. Such pumps help keep a nuclear reactor at the right temperature as it generates electric power.*





## Scotland, to Arabia, to Prudhoe Bay— our pump products tackle the big ones

High purity water is moved through a series of pumps designed solely to add pressure as the water is gradually heated. Then the water goes to a boiler-feed pump—which may be anywhere from 4,000 to 40,000 hp in size—to further increase the pressure of the water, now at temperatures as high as 350°F, and to pump it into the main boilers where it will be turned into high-pressure steam to drive the turbines.

That done, the steam is moved by other pumps, as it condenses to hot water, to towers where it cools. Since some water is lost in the cooling process, make-up pumps replenish the water supply, and the cycle continues indefinitely.

The power generation functions in a nuclear plant are similar. The primary difference is that heat for steam generation is created by nuclear reaction rather than by burning fossil fuels. This calls for a dual circulation system. In one loop, water, gas or molten metal is pumped through a reactor core to absorb heat and then to a heat-exchanger system. There the heat is transferred to a separate water loop in which the steam to drive the turbines is made.

The metallurgy and engineering requirements for pumps to be used within a nuclear loop are stringent. They may, for instance, call for stainless steel castings weighing 25 tons, extensively x-rayed, inspected and tested to be free of defect. All components must get quality certification. Advanced techniques are required.

*As a general operator at the Total Oil Marine plant near his home town of St. Fergus, Aberdeenshire, on Scotland's North Sea Coast, Garden West is part of Britain's multi-billion-pound effort to tap the bonanza of North Sea oil and gas. The plant uses five big York compressors to separate liquid hydrocarbons from natural gas piped in from 200 miles offshore, at the rate of 1500 million cubic feet a day.*

Nuclear pumps must operate fail safe for many years.

In moving fluids, valves are integral to control flow. But in a nuclear plant, many areas are simply not available to people for manual control. So we make a line of very special nuclear valves actuated by electric, pneumatic or hydraulic means, and remotely controlled. They may be anywhere from one inch to 24 inches in diameter, and are designed to respond very quickly and accurately in high pressure, high temperature environments.

Our commitment to the petroleum industry is equally strong. Our pumps are found at every stage: getting the oil out of the ground, refining it, and transporting it.

At the oilfield, relatively conventional pumps move crude oil from the wellhead to a storage tank or refinery. High pressure pumps inject fluid back into the oil formation zone for secondary recovery techniques. This forces more oil out of the ground by replacing it with an equivalent amount of liquid to maintain underground pressures.

One of the most specialized oilfield pumps is our submersible Centrilift®.



Today, new wells have to be sunk deeper and deeper to tap oil—often two to three miles down or more. Oil found at those levels has to be forced to the surface.

A Centrilift pump, which may also come in several sizes depending on the depth at which it must work, hardly looks traditional.

One designed to work 10,000 feet down may be as long as 160 feet, in several coupled sections, but only five inches in diameter to fit inside narrow well casings. A series of 400 impellers in a row—even though each is small in diameter—can force as much as 1500 barrels of crude oil a day the two miles up to the surface.

At the processing stage, a refinery complex may require as many as 40 different models in a range of sizes. Each will be selected to move the right volume at the right pressure for each stage as crude is divided into its usable components.

For fuel processing, Borg-Warner also offers other capabilities. Natural gas, like crude oil, has many components. Moved as it comes from the well, it could corrode and destroy pipelines. So industrial refrigeration is used to separate out several components. The gas is first chilled to about 32°F, which precipitates out water. With the temperature dropped to 10°F, butane drops out. And at -45°F, propane can be collected. Aside from protecting the pipelines, these hydrocarbons have a wide range of uses—and a relatively higher commercial value than the remaining methane, the “natural gas” that burns in home and factory furnaces. Even for nuclear fuels, production of uranium hexafluoride in the gaseous diffusion process requires our low temperature refrigeration.



*Nuclear valve components pass through a rigorous series of dye penetration tests and x-rays to make sure they are structurally perfect. Any weakness is ground or drilled out, and the surface is “prepped” by welders, like Robert Thacker. The next step: fill the holes with welding metal, and start the test cycle again.*

Transporting oil by pipeline is another major stage.

On the Trans Alaska pipeline, which runs about 650 miles from Prudhoe Bay to Valdez across rough and widely varying terrain, up to 1.2 million barrels of oil can go through the 48” diameter pipe daily. To move that volume that far requires ten pumping stations. Borg-Warner supplied the initial group of ten 14,500 hp pumps.

Similar, if smaller, Byron Jackson mainline pumps have been going into oil fields in the Middle East and elsewhere for more than 40 years.

But pumps themselves must be powered; points where power shafts enter the pumps are potential sites of leakage that might be hazardous, polluting or wasteful. So we produce seals to eliminate or control those problems for as long as possible.

In our “mechanical seals,” one element is stationary, fixed to the pump; the other, attached to the shaft, rotates. Fluid is sealed into the pump because of the extremely close contact between the two elements. The “face” of each is so finely machined, to a “flatness” measured in millionths of an inch, that only enough fluid can migrate through to serve as a lubricant.

Even our seals can begin to leak, of course—in as short a time as six months if an extremely corrosive material such as hydrochloric acid is being pumped, or as long as eight years for boiling water in a power generating station. In refinery operations, the average service life is about two years.

Should a seal begin to leak and force a pump to be shut down, an entire plant operation might have to be stopped. So one of the most important parts of our mechanical seals business is the ability to deliver a replacement fast, anywhere, for anything from a single spring to a complete seal, to help keep pump downtime to an absolute minimum. □

*Borg-Warner's Doug Richison worked for months with Continental Oil Co. in Ponca City, Okla., to develop a special mechanical seal for pumps on a new kind of pipeline—one that will move coal in chunks up to four inches in diameter, rather than as powder in slurry form. The technique may also be used to cut costs of moving other kinds of minerals which now travel by conveyor or railcar.*



## Consumer products: little noticed, but omnipresent, plastics color our lives

Although everything we do ultimately affects consumers, only a few Borg-Warner products or services can be recognized as things that a consumer might buy directly.

Our air conditioners and heat pumps go into homes. More and more people who do their own car repairs are specifying Borg-Warner brand replacement parts. We help finance many kinds of personal purchases.

But one ubiquitous Borg-Warner product that is part of vast numbers of consumer goods may also be the best exam-

ple of the "invisibility" of the things we make ourselves. That is Cicolac® ABS.

It's in automobiles from front to back. Some business machines are formed from this adaptable plastic, and so are parts of snowmobiles and of tractors.

Most of all, it surrounds us in our daily lives without our being aware of it. One prime example is within most people's direct line of sight through most waking hours.

There's no reason, of course, for a user to know that his or her telephone is made of Borg-Warner's Cicolac ABS—or even to realize consciously that it's made of plastic.

But American telephones have been made with Cicolac ABS for some 20 years. It was initially picked because it solved a number of problems peculiar to phones. It's tough—telephones drop easily, but must not break. They are grasped by greasy hands, and brushed by lipsticked mouths, but must



not stain. From a production standpoint, phones must be easy to mold and stay true to color. Today, with this utilitarian instrument becoming an item of high decor, Cicolac ABS is making possible an explosion of colors and shapes undreamed of a few years ago.

ABS stands for acrylonitrile (which gives the plastic high chemical resistance and surface hardness), butadiene (which adds toughness) and styrene (which provides excellent surface characteristics and easy processing). Put these three together in various quantities and with differing processes, and the result is materials with a remarkable range of properties.

Cicolac ABS can be designed for high impact, tolerance to high temperatures, great durability, easy formability, surface quality, flame retardance, transparency—or any combination of those characteristics. Actually, we produce 80 different grades, each with its own set of properties, to meet



*Our customers will injection mold, extrude or thermoform it into a countless variety of products; but Cicolac® ABS usually comes to them this way—as tiny pellets, colored to specification.*

different specific requirements.

As a result, the average person sees, touches, uses items made of Cicolac ABS all day long.

It's in appliances of all kinds. Cabinets of television sets, sewing machines, vacuum cleaners, blenders, hair dryers, electric toothbrushes, in interior shells of refrigerators.

It's in dozens of parts of the house itself: bathroom fixtures, wall moldings and light fixtures, furniture and microwave oven doors.

And for play time: toys, fishing reels and tackle boxes, camper tops, tennis rackets, electronic games and pocket calculators, football helmets, lawn sprinklers and power tools. One popular drill contains three different grades of Cicolac ABS: a high heat grade around the motor; a high impact grade for the handle, most likely to take the brunt of a drop; and a "standard" grade for the parts of the tool less subject to stresses. In the very high heels now back in fashion for women's shoes, Cicolac ABS can take the stress better than any other material.

Even at the office, newer variations of Cicolac ABS are beginning to replace steel as structural support members in such business machines as photocopiers and typewriters.

However all this may sound, ABS is not the perfect, all-purpose plastic. It can't make a good fabric, as does polyester or acrylic, nor a transparent film such as polyethylene. It can't be used for parts that need extreme hardness.

But one leading trade magazine has called ABS a "super-resin, better than any other plastic because of its extraordinary balance of performance properties." And Cicolac ABS has turned out to be one of the most versatile of plastics for manufacturers to work with. It can be molded, extruded, vacuum-formed, even foamed. It can be cut, routed, drilled, riveted, cemented or heat- or ultrasonically-welded.

Cicolac ABS has been the leader in this field since initial development of the material only a little more than two decades ago—precisely because it was never considered as a single plastic. It was regarded from the beginning as the building block for a broad range of engineering thermoplastic

*Cicolac® ABS is fashionable. The stiletto heels of model Rosemary McGrotha's shoes, like the telephone she holds, get their impact strength from it. This picture was made for Harper's Bazaar by Andrea Blanch, a rising new talent on the New York fashion photography scene.*







## 'Super-resin' ABS aids work and play; newer chemicals help other plastics

products that could be tailored to many applications.

A generation ago, we produced considerably less than ten million pounds of the material in a handful of grades. In the latest year, our capacity was well over a billion pounds of our 80 different grades, most of which can be produced in as many as 3,000 different colors.

If ABS itself is difficult to recognize, out of our work with these materials has come something that's even less visible—a family of chemicals used as modifiers for other resins.

Our Blendex® group, for instance, includes several sets of polymer combinations which act as modifiers for polyvinyl chloride (more commonly known just as vinyl) resins.

Alone, vinyl has some of the chemical characteristics of glass; it is brittle, easily cracked or broken. But when a Blendex modifier is added to polyvinyl chloride during production, billions of tiny rubber-like particles, each about the size of a wavelength of light (perhaps a million to a lineal centimeter) are intimately dispersed among the vinyl particles, acting like tiny shock absorbers.

This gives vinyls that must be relatively rigid a resiliency and flexibility they would not otherwise possess.

Credit cards are one simple example. Blendex-modified vinyl provides a card that is both stiff and flexible, can be used almost indefinitely without cracking, and can take embossing of name and number without losing its shape.

The modifiers have also reduced one common household hazard. Remember the trauma when slippery hands dropped a glass bottle of shampoo in the shower? Many Blendex formulas match the refractive index of vinyl; now you can buy shampoos in flexible transparent vinyl bottles that can be dropped to your slippery fingers' content.

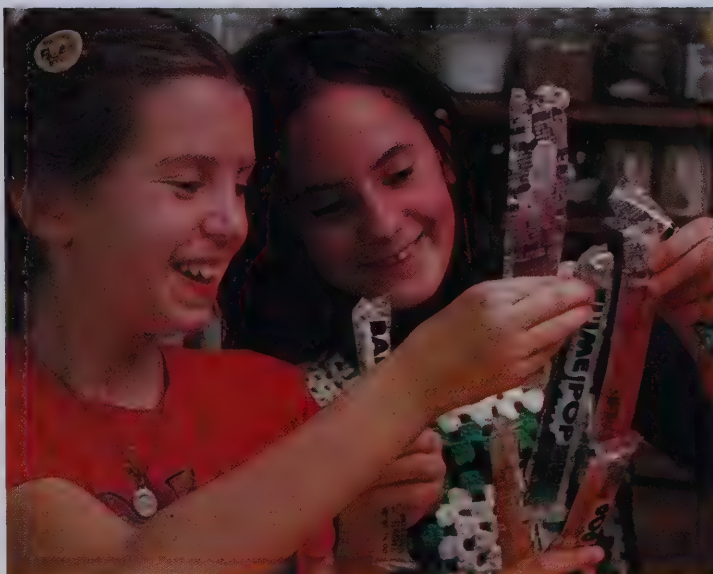
Moreover, these modifiers have been the key to a revolution in retail packaging. Today a major marketing tool is the "blister-pack"—a stiff transparent film attached to a cardboard backing, artfully shaped to both display and protect products. These packs are generally made of vinyl modified to reduce its inherent brittleness.

The same selling idea—showing the customer what he or she is buying—has been applied to the many kinds of goods now packaged in flexible films. Here, others of our chemicals go to work: a series of stabilizers, used primarily with olefins such as polyethylene and polypropylene.

The production of transparent polyethylene films, for instance, involves a number of heat processes which would tend to make the final films cloudy. Our Weston line of stabilizers prevents this discoloration and helps retain the transparency or color clarity of the final film.

One of our newest stabilizers—we call it Weston 618™—serves a special purpose. It is the first such stabilizer approved by the Food & Drug Administration for transparent films used in direct contact with foods. For an enormous variety of eatables from candy to vegetables to meats, the very clarity of the transparent wrapping can make the food look more appetizing and tempting to buy. □

*Wielding his Wilson T2000 racket with awesome authority, top-ranked tennis star Jimmy Connors charges to victory in the 1978 U.S. Open. The racket, one of Wilson's most popular steel models, sports a handle built with Cyclocac® ABS from Borg-Warner Chemicals.*



*Shaynie Barcroft and Katelin Mauney of Evanston, Ill., have trouble deciding which color of "Flavor-Ice" they like better, because both look so good in their packages. Borg-Warner chemical additives help keep the flexible film clear and food-safe.*

*At a laboratory in Parkersburg, W. Va., chemist Lisa Bullock and section manager Leo Valeserri compare otherwise identical rolls of high density polyethylene to determine if the Weston 618 "food-safe" modifier in one has had any effect on clarity.*





# Agribusiness: from seeding to supermarket, we're part of the food supply chain

"Agribusiness" is a word that has crept into the lexicon only recently. Webster defines it as "the total combination of the producing operations of a farm, the manufacturing and distribution of farm equipment and supplies, and the processing, storage and distribution of farm commodities."

Borg-Warner has a hand in every one of these phases of the food supply chain. We produce essential components for all kinds of farm machinery. We help irrigate lands, plant and harvest crops, and preserve and transport foods. We even help farmers obtain the equipment they'll need before a seed is planted.

Our relationship with the farmer goes back to the very beginning of the company. A half century ago, we were already a leading producer of tilling discs, and we are still the leader in that specialty. The tilling disc prepares the ground for planting. We make them in hundreds of variations—in combinations of size or shape to meet any required depth of cut, local soil condition, or preferred farming technique.

Discs are, however, a small part of the total range of products and services that we offer to agribusiness. Many are components based on the same principles as the parts we make for other vehicles: four-wheel drive mechanisms, hydraulic motors, pumps and valves, radiators, special purpose transmissions, key parts of power takeoff systems.

By and large, however, these parts are bigger, more rugged, specially lubricated and sealed, to survive the rigors of heavier work and for protection from abrasive soils and constant exposure to an open environment. "Downtime" is even less allowable on the farm than in industrial work: nature's timetable rarely allows the farmer to catch up later.

Some of our products used in agriculture are unique: our proprietary Power Wheel™ drive, for example. In the Power Wheel drive, a central power source transmits hydraulic energy to drive each wheel independently, eliminating the complex of components necessary in the standard power train to transmit energy. The power source can be high up, leaving the ground level clear for, say, a windrowing machine harvesting alfalfa. As a second feature, the Power Wheel drive permits an infinitely variable ground speed.

In a center pivot irrigation system, for instance, the vehicle carrying the water spray mechanism can be set to move so slowly and smoothly that it will travel only a mile in a whole day without ever actually stopping.

In large areas of the country, irrigation is necessary to grow any crop at all, and Borg-Warner's Byron Jackson® pumps bring water up from underground aquifers to ground level where it's needed. As water tables drop, it's necessary to go deeper and deeper for adequate supplies. Our self-contained vertical submersible pumps can tap pools more than 1,000 feet deep, with minimal maintenance for years. When the water reaches the surface, Byron Jackson booster pumps move it laterally into irrigation channels, or to "short field" irrigation equipment whose lightweight, movable and durable pipe

*When soil and season are right, the tractor has to be ready—and Owen Koth, testing soil consistency on the Dick Evans farm outside Phoenix, knows that the Borg-Warner drive train components in the tractor he's driving are completely reliable.*











*Roundsman Bob Piddington has been delivering milk in the Lambeth area for London's Express Dairies for 20 years. York industrial refrigeration equipment is widely used in processing milk and other foods in Great Britain.*

## **Irrigation, harvest, preservation, even packaging, are in our province**

and sprinkler heads are made of Cicolac ABS.

At harvest time, other Borg-Warner devices help operate equipment that cuts, bales and stacks. One combination, consisting of power transmission equipment, adjustable speed controls and electronic sensors, is used in field drying of grains. Freshly cut grain is loaded on a conveyor which carries it through a heating unit.

The sensors monitor the amount of moisture in the grain, and signal the speed controls to slow or speed the conveyor for optimum drying of each batch.

Once cut, caught, picked or slaughtered, food must reach the market still fresh. The key is often our commercial refrigeration. Fruits and vegetables, meats and fish, can be shipped safely from half-a-world away as long as they are properly cooled.

Beef can travel from New Zealand to New York in ship holds that are, in effect, enormous refrigerators. Oranges, avocados, and bananas are picked green, and shipped under refrigeration conditions that allow them to ripen at a rate timed exactly to their delivery to market. Vegetables may be frozen right at the picking site with Borg-Warner equipment. Our chilling systems make it practical to ship foods in rail cars and trucks, and store them in warehouses for long periods, safely and without loss of nutrition.

Fish and poultry call for special techniques—initially, heat in the animal tissues must be removed quickly at very low temperatures. Later the foods can be transported and maintained at a different level of cold. Even soft drinks need one of our cooling systems—carbonation of water is much





easier at low temperature. We will custom design the right refrigeration system for any food application.

Our chains and associated energy transfer components move foods during processing and packaging. And when at last they are put on the supermarket shelves, we help the customer see what he or she is buying. Some of the chemical additives that we make to go into other resins make it possible to produce transparent films used to package foods safely and with eye-catching clarity.

America not only feeds itself, but as the leading exporter of foods, helps nourish much of the rest of the world. Now, increasingly, we are sharing our agribusiness technology. Borg-Warner intends to remain a part of this effort to help the world feed its billions. □

*Casa Grande, Ariz. gets an average of only six inches of rainfall annually—not enough to keep Keith Carlton's 800 acres of alfalfa and cotton flourishing. For that, Carlton (right) depends on Borg-Warner's Byron Jackson irrigation pumps, sold and serviced by his long-time friend, Bill Roberts (left).*









# Machinery: the complex job of delivering 'work' at the right place, pace and power

Experiment: Try to name *one* thing that the average person uses, wears, or eats that has *not* at some stage—or at many—been shaped, processed or moved by a machine.

Modern man is so intimately bound up with machines that we forget how complicated machinery may be. For instance, regardless of the power source, the form of energy it puts out can rarely be used directly. Instead it must be moved through a series of coupled shafts, speed reducers, chains, gears, bearings, electronic controllers, and clutches, so that the complex can deliver "work" at the right place, in the correct combination of speed and power, with as little loss of the original energy as possible.

Borg-Warner produces a complete package for the transmission of energy in machinery—most, but not all, under the Morse label. Our "market" is potentially anyone who uses *any* machine for *any* purpose. We sell individual components or the full range of products worldwide, directly to original manufacturers of machinery, and for replacement purposes through a network of some 800 full-line distributors.

Chains are a major element of the energy transmission package. They are light, flexible, stable and strong. Some look like a single strand of links; some like a wide "belt" made of thousands of small precision parts. Regardless of appearance, chain often represents the most efficient way of transferring energy in the form of motion. A Borg-Warner predecessor company was making them before the turn of the century; today we remain one of the world's major producers.

Roller chain, most familiar as the kind on a bicycle or a power lawn mower, is one of the oldest, and still most widely used. This type passes around a turning sprocket whose teeth stick up through spaces between the rollers, pushing the chain forward. At the other end, the moving chain transfers the energy it carries by turning another sprocket.

A newer kind is "inverted tooth," or "silent" chain, so called because it is quieter than the roller type. Silent chain has hundreds of wedges that engage the sprocket teeth.

Our "Hy-Vo"® chains are proprietary improvements on the "silent" principle. First introduced at the end of the forties, Hy-Vo has gone through nine generations, each lighter, stronger, and capable of higher speeds. The newest version has 40 per cent more load carrying capacity than before.

Chain comes in many sizes. Photocopying machines use one of the more delicate types, with only 3/16-inch pitch (pitch is the distance from the center of one tooth to the next). One foot of a single strand of such chain contains more than 400 individual pieces. Conveyor lines may use chain with one-inch pitch. Even larger chains power oil rigs. Other sizes may show up on lift trucks, hoists, printing presses, or practically any other kind of machine.

A single packaging line may use a variation for the con-

veyor itself, the boxes to be filled, the supply of material. Just the "measure by weight" mechanisms each require six to eight different chains.

Many of these chains have to move at speeds different from the original power source. So speed reducers form an essential part of an energy transmission complex. Speed reducers use a series of gears to slow the original turning speed by any factor necessary, convert the balance of the energy from speed to power to move heavier loads—and make the conversion without losing more than a tiny fraction of the original energy from the source.

Bearings are equally vital in the transfer of energy.

A bearing is a device designed to support a turning shaft with a minimum of friction. It is composed of inner and outer rings which turn on balls or rollers placed between them. Balls are used for lighter loads and higher speeds, rollers when



*Measuring cages that are part of the sprag clutches turned out at our Bellwood, Ill., plant, Pat Aguila pauses to explain that such "one-way" clutches are used on machinery such as printing presses to make sure the turning components can "free-wheel" when not being actively driven.*

heavier loads must move more slowly. This complex is mounted in a housing firmly connected to the machine.

The concept is ages old—but metallurgical and other techniques are new. Our Sealmaster® bearings, for instance are so rugged and so effectively lubricated and sealed that, in an average application, they will last for years of work without replacement. Allowing for size, seals and other variations, we produce some 8,800 different bearings.

As with many of our other products, energy transmission devices are rarely consciously noted—they are "just part of the machine." But without them, machines could not work, and much of life as we know it would come to a halt. □

*Bearings distributor Carter Anderson (left) talks shop with R.C. Waters and Dave Fudge, supervisors at the Hercules, Inc. plant in Brunswick, Ga. Behind them, two-ton loads of pine stumps crash onto the chipper for washing and transport to machinery that will crush them to resin. Morse Sealmaster® bearings have reduced downtime at this plant because they stand up to pounding, dirt and water to keep shafts turning smoothly.*







# Financial services: credit makes the world go round, for sellers and buyers both

America has long had a "credit economy." Homes are bought with mortgages, cars on time, and payment for entertainment is deferred with credit cards. Industry uses large amounts of borrowed funds to expand operations.

So does Borg-Warner—but one of our most rapidly growing businesses is also making credit available to others.

About one in every five appliances, television sets or stereo rigs sold throughout the United States last year was financed on at least part of its way from production line to final home by Borg-Warner. So were large numbers of boats, motorcycles, snowmobiles and mobile homes, hay balers and giant tractors. All kinds of merchandise was shipped over the nation's rails in freight cars that we own, and hundreds of small businessmen were able to pay rising insurance premiums through one of our services.

What's an *industrial* company like Borg-Warner doing in activities like these? Quite a bit.

Our financial services operation started in the fifties, almost incidentally, as a captive business to help sales of a line of appliances we no longer make. Today, Borg-Warner Acceptance Corporation, with its subsidiaries, ranks close to the top among independent finance companies—offering dealer and consumer financing to a range of industries, as well as leasing and specialized insurance services.

In 1978, transactions with more than 50,000 different customers, handled through about 330 branch offices in seven countries, totaled some \$2.3 billion.

We started with inventory financing—sometimes called "floor planning"—and that still represents the largest single aspect of our financial business. It works this way.

Refrigerators, washing machines, color TV and stereo sets are rarely impulse purchases—but once a customer starts looking, a dealer has to be able to offer both selection and immediate delivery to make a sale. Keeping hundreds of different items in stock, each with a price tag of several hundred dollars, could require tying up capital in large amounts unnecessarily for many independent dealers.

Inventory financing, however, allows a dealer, for an affordable service charge, to stock but not actually pay for his merchandise until it is sold to the retail buyer. The manufacturer or distributor is paid by the finance company when the order is delivered; the dealer pays the finance company as he sells. The finance company holds a security interest in the merchandise until it is sold.

Today Borg-Warner has agreements with more than 1,000 different manufacturers of consumer products and with over 35,000 individual dealers. What works so well for appliances, works equally for a large number of other consumer goods particularly for such "big ticket" items as boats, recreational vehicles, musical instruments, and even mobile homes.

Pleasure boats today can cost anywhere between \$5,000 and \$100,000; the inventory of a large marine dealer can range as high as \$1 million, although the average may be substan-

tially less. Dealers in musical instruments also have high cost inventories; a good quality oboe can run to four figures.

When Borg-Warner became the first to finance dealers of motorcycles and snowmobiles, both fields were considered too risky by most lenders. Motorcycles had a poor image, and snowmobiles were seen as a passing fad. Now both are regarded as credit-worthy tools, not toys.

In today's credit society, relatively few people pay cash for major purchases. The successful entrepreneur who buys a \$25,000 power boat is as likely to want to pay for it in installments as the young couple buying their first \$500 refrigerator. So, Borg-Warner also helps finance the consumer. In effect, we pay the dealer directly for the merchandise, then are repaid in monthly installments by the buyer.

If the system works for consumers, why not for others, such as farmers, who need some very expensive tools? Major



John Gerfen (left), treasurer of W. T. Armstrong Co., Elkhart, Ind., maker of brass musical instruments, knows that retail dealers who sell his instruments will be helped to finance their inventories by Borg-Warner Acceptance Corp. Vince Barauskas and Jim Hentz, BWAC officials, explain the techniques used.

producers of agricultural implements generally arrange dealer-financing for their own products. Dealers in specialized equipment, made by smaller, "short-line" companies, also need financial aid. So Borg-Warner branched into inventory financing for dealers in special-purpose farm equipment. Such items range from "short-field" irrigation equipment to 750 hp tractors that can cost over \$100,000 each.

One of the fastest growing of our financial services is leasing—of anything used as an economic tool, from an electric typewriter to an airplane. If a customer needs it, we'll

*The Long Prairie, Minn., high school band, considered one of the country's best, struts up New York's 5th Avenue in the Thanksgiving Day parade. All around the country, instruments like theirs can now be bought through credit arrangements.*



## **We help buy a stereo set or a sloop; lease an airplane, or pay a premium**

buy it ourselves, and make it available to him for whatever period of time and schedule of payments fit best with his cash flow and other business needs.

Equipment leasing is becoming an important operational technique. It can put, or keep, someone in business at a lower investment than if he had to buy all his equipment outright. He doesn't have to tie up large amounts of capital for purchase, or even down payment; outstanding lines of credit remain available for other purposes. The monthly lease charge is often less than he would have had to pay in loan install-

ments and interest for an outright purchase.

Our biggest single category of leased material is farm equipment—in fact, the equipment that we lease to an individual farmer we may well buy from one of the agricultural dealers whose inventories we finance.

Other important categories include electrical equipment, production machinery, and office equipment. The range is almost unlimited: construction machinery; fishing boats (but not pleasure craft); private branch telephone systems; freight cars. For one insurance company we supplied all its desks, chairs and other furniture; airlines use our 727s.

Big tickets, however, are not attached only to hardware. Proper financing can ease burdens on intangibles that come with high price tags, too.



*Andy Donaldson (left), a branch manager for Borg-Warner's leasing business, arranges to buy a fishing trawler built by Rodney Thompson (right), of Titusville, Fla.*

*... Commercial fishermen lease such boats from us, avoiding the need to tie up large amounts of capital. At right, deck hands separate large Gulf shrimp from other catch aboard a trawler off the Florida coast.*





Take property and casualty insurance, for instance. Traditionally, most businessmen simply paid their premiums annually. But as replacement costs and damage awards have skyrocketed, so have insurance premiums. Now paying a premium in a single lump sum can be hard to handle.

This burden falls most heavily on the small businessman. For instance, a roofing contractor's premiums against accident damage and personal injury can run as high as \$30,000 annually.

He could, of course, go to the bank for a loan at his regular bank rates—but that could crowd the line of bank credit he needs for his routine operations. Now, he can, in effect, establish additional lines of credit simply by financing his insurance premiums separately.

Insurance premium financing is a new and rapidly growing field for Borg-Warner. Even churches, which rarely have large sums of spare cash on hand, still need fire and accident coverage.

Premiums are financed much the same as hard goods. Borg-Warner pays the premium to the insurance company; the policy holder repays us in more convenient monthly payments, with the premium itself as collateral. Financing, of course, increases the cost of insurance slightly—but that cost can be much less than borrowing the needed funds through conventional channels. □





## Protective services: early detection, quick reaction short-circuit fire and crime

Nothing can stop a crime from being attempted. No matter how careful one is, some fires do start; sometimes irreparable harm has already been done before a fire department can be notified and respond. But fire damage can be minimized, and successful burglary prevented—if detected quickly enough.

Safety of persons and property has traditionally been the responsibility of local governments. No public body, however, has the resources to establish universal early detection and prevention systems—nor the right to establish small private ones.

With the costs of fire and crime losses skyrocketing, more and more individuals and companies are turning to private protective services, such as Borg-Warner's Baker Industries subsidiary.

Our protective services and products, primarily under the names Wells Fargo®, Pony Express® and Pyrotronics®, are devoted to providing early detection of fire and theft *before the damage is done*.

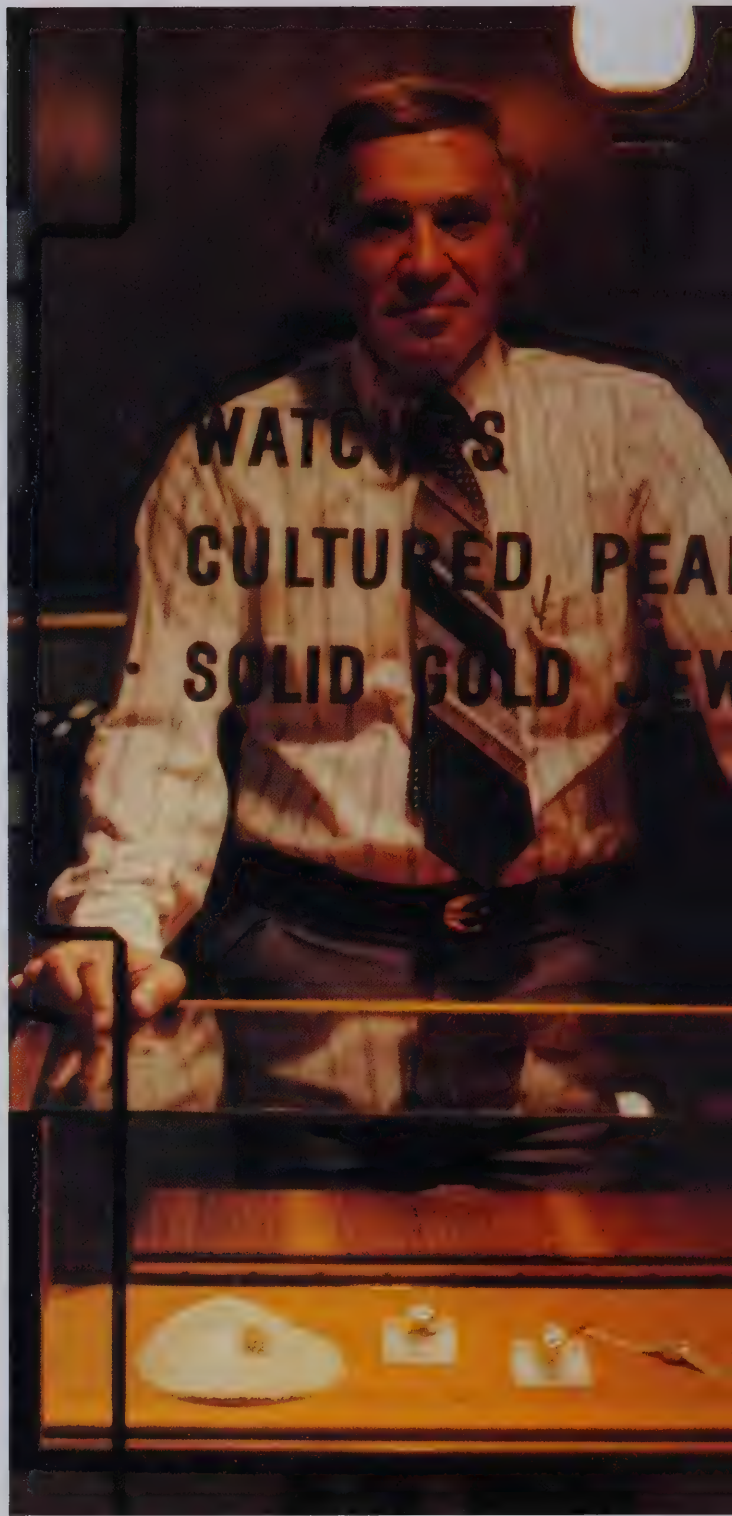
Weapons in the war against theft are partly psychological—sometimes just the visible presence of a uniformed guard at a sensitive spot.

Against both crime and fire, they are also technological: an array of sensitive detection devices at a protected installation, permanently connected to a central alarm center that is monitored 24 hours a day.

Our Pony Express symbol is seen by thousands of persons daily. On our Wells Fargo armored cars that move cash and other valuables both in major metropolitan areas and in smaller cities. On courier vehicles that speed time-critical business material to a destination. On the uniforms of security guards who patrol industrial plants and high-rise apartments, museums, airports, department stores, hotels and hospitals.

Less visible are our fire detection and warning systems used by thousands of businesses to guard plants and offices. Or the even more subtle anti-intrusion systems that protect everything from jewelry stores to sensitive military and intelligence installations.

The fire protection system for a large industrial plant must be versatile enough to monitor machine lines, storage areas, computer room, foundry, offices. It may use several kinds of Pyrotronics or Wells Fargo detection devices.



Some areas will need ionization detectors sensitive enough to pick up the invisible gaseous products of combustion before there is any evidence of smoke. In places containing potentially quick-smoldering materials, photoelectric detectors might be best; where a high level of heat is always present, thermal detectors tell if the temperature rises above a predetermined "normal." Other detectors may work on ultraviolet or infra-red principles.

Regardless of the type, all sensors are designed to react rapidly. They may either activate alarms that alert plant

*Private patrolman Bill Lewis keeps a sharp eye out for intruders near the mansion of one of the celebrity-subscribers to the Bel Air Patrol, a unique private protective service Borg-Warner offers to residents of the exclusive Bel Air section of Beverly Hills, Calif.*





management and security personnel to the danger, or send a signal to a Wells Fargo central alarm station, where our own operators summon firefighters immediately.

A complete system, in fact, doesn't even wait for the fire trucks to arrive. In industrial and commercial fires, more people are hurt and killed from smoke inhalation than from burns. When smoke is detected, special devices immediately close air ducts, shut down fans, and close fire doors so that smoke does not circulate past the immediate fire area.

In a computer room, water might do as much harm as fire itself. Upon detecting a fire, a Pyrotronics system sounds alarms to warn people to clear the area, then floods it with a heavy noncombustible gas that will smother a fire without damage to the computer operation.

Burglary can also be short-circuited by Wells Fargo anti-intrusion systems.



*John Rice supervises the night shift at Wells Fargo's central station in downtown Chicago. Every minute of the day or night, a monitoring crew is alert to possible signals from fire or intrusion detection devices—and ready to dispatch help to the premises of thousands of subscribers. One of Rice's charges...*

*...is jeweler Harold Burland, a tenant in Chicago's unusual Mallers Building, which houses 13 floors of diamond and jewelry dealers. Many of them are Wells Fargo customers.*

Interruptions in electrical or magnetic currents around doors or windows may be the first sign of illegal entry. Pressure-sensitive mats will pick up the touch of a footstep. Invisible ultrasound and microwave generators, photoelectric systems, and vibration sensors all can warn of an unauthorized presence in a space as small as a closet or as large as a warehouse. The anti-intrusion systems may even include cameras able to photograph the would-be burglar for trial evidence.

These devices also can signal the Wells Fargo central alarm station. Police headquarters will be informed by direct line immediately, and Wells Fargo patrols may also be dispatched to the scene to assist as necessary.

Most of these techniques were designed to protect business; they can be just as effective for private homes and residential neighborhoods.

The Bel Air section of Beverly Hills, Calif., is home to many entertainment celebrities and prominent executives—targets for souvenir hunters and cranks as well as for professional thieves. To protect property and privacy, hundreds of them subscribe to our unique Bel Air Patrol. This system combines fire and intruder detection devices connected to a central alarm station with a 24-hour-a-day patrol of subscribers' homes by armed guards.

The Bel Air Patrol works in close cooperation with local police and fire forces; area security is improved by the greatly increased speed of notification if problems do arise. □





*Having pumped hard to get there, a thirsty bicycle racer pauses on his training ride through hilly Palos Verdes, Calif., for a cool drink from a public fountain. The water that meets him there didn't have an easy trip either. Byron Jackson pumped it up the hills, a level at a time, through several pumping stations.*

*The equipment involved in our service to the municipal water market includes vertical booster pumps, like the one below, which speed water from public reservoirs to private faucets, through a labyrinth of pipes.*



## Other markets: basic skills can be transferred, but new growth calls for new ventures

We have told you about our major markets—but the technologies and capabilities we focus on these markets can and do serve a number of smaller, special areas as well.

For instance, we provide nuclear submarines with air conditioning systems, so silent that no sound is detectable by enemy hunters. We make hydraulic actuators for wing parts in civilian and military aircraft, that enable jet planes to maneuver easily at either sub- or supersonic speeds. We provide pumps to maintain the water supplies of cities and towns—and rubber fenders to protect ships during docking.

But any company's growth depends not merely on remaining strong in its existing businesses; the challenge is in finding new ones. We are always on the lookout for ways to enter what we judge will be the high performance business areas of the future.

Two which have developed only within this latest decade give an indication.

Some 20,000 schools, in all 50 states, already use a unique educational tool we call System80®. Essentially, it is an audio-visual teaching machine, so designed that it can be used independently even by a four-year-old. It allows a child to work at his or her own pace, and provides the immediate feedback and repeatable instruction so essential to learning. More important than the machine are the 1,000 different audio-visual "lessons" we provide, in the basics of reading and mathematics. Most are designed to start youngsters right, in the earliest grades—but they have been adapted to remedy weak skills among high school students, or to teach illiterate adults.

The new era of government regulation of environmental and industrial safety offered another opportunity.

Many small plants are unable to set up adequate facilities to monitor and test emissions and other conditions on their own. So our Kemron operation provides that vital service.

Skilled technicians in well-equipped mobile laboratories visit such small companies to test ambient conditions. Some simple analyses can be done on the spot. Special monitoring equipment "measures" some phases immediately, transmits data directly over telephone lines to a computer center which can analyze the data and send a report back to the client. When more sophisticated analysis is required, our technician can take samples of water, air, or even blood to one of our five large laboratories for more detailed examination.

Many other areas are well into the development stage. Among them: new approaches to thermo-electrics for refrigeration and power; new techniques for high-density powder metallurgy. "Nothing ventured—nothing gained" is an age-old philosophy. We have established a companywide program of "seed ventures," experimenting in many promising areas.

We intend to "plant" many of these seeds. We know some will fail—we hope many succeed. But testing and planning for the future ranks high among the businesses of Borg-Warner.

*Sandra Johnson, an industrial hygienist for our Kemron subsidiary, conducts air sampling at a client's plant. The device on the worker's collar records his daily exposure to chemicals or metals that may be floating in the plant air. She will send the data to one of Kemron's central laboratories for analysis.*







# The Businesses of Borg-Warner

The preceding pages have explained Borg-Warner in terms of the ways we serve the public—i.e., the human needs we provide for in the major markets we serve. Markets, however, represent just one way to present the company. Another is through our principal lines of business—the major product and

service areas on which we base our financial reporting. They are listed below, including the divisions, subsidiaries, affiliates and joint ventures each comprises. Where Borg-Warner's ownership of these units is less than total, we have noted the actual percentage in parentheses.

## Air Conditioning

Air conditioning, heating and refrigeration equipment; air conditioning compressors for cars, trucks and farm equipment.

### York Division

*York, Pa. and Madisonville, Ky.*

#### York Division

**Borg-Warner (Canada) Limited**  
*Rexdale, Ont. and St. Jerome, Quebec*

### York International

*York, Pa.*

#### York Division

**Borg-Warner (Australia) Limited**  
*Gladesville, N.S.W., Australia (77%)*

#### York Division

**Borg-Warner Limited**  
*Basildon and London, England*

#### York-Europe

*Brussels, Belgium*

#### Brown Boveri-York

*Mannheim, West Germany (50%)*

#### Le Froid Industriel-York S.A.

*Paris, France*

#### Mitsubishi-York, Ltd.

*Takasago, Japan (49%)*

#### York Aire S.A.

*Monterrey, Mexico (49%)*

#### Recol S.A. de C.V.

*Durango, Mexico (49%)*

### York Automotive Division

*Decatur, Ill.*

## Chemicals & Plastics

Cyclac® brand ABS, Blendex® impact modifiers and other thermoplastic resins; styrene monomer; polymer additives and dispersions; petrochemicals.

### Chemicals & Specialties

**Borg-Warner Chemicals**  
*Parkersburg and Morgantown, W. Va.*

### Petrochemicals

**Borg-Warner Chemicals**  
*Parkersburg, W. Va.; Carville and Geismar, La.*

### Plastics

#### Borg-Warner Chemicals

*Parkersburg and Washington, W. Va.; Oxnard, Calif.; Ottawa, Ill.*

#### Borg-Warner Chemicals

**Borg-Warner (Canada) Limited**  
*Cobourg, Ont.*

#### Borg-Warner Chemicals International

*Chicago, Ill.*

#### Borg-Warner Chemicals Europe

**Borg-Warner International S.A.**  
*Brussels, Belgium; Amsterdam, Holland; Grangemouth, Scotland*

#### Marbon Chemicals Limited

**Borg-Warner (Australia) Limited**  
*Dandenong, Victoria, Australia (77%)*

#### Ube Cycon, Ltd.

*Tokyo and Ube City, Japan (49%)*

### Kemron Environmental Services

*Marietta, Ohio*

*Monitoring and analysis of air, water and waste effluents; industrial hygiene consultation; biological analysis.*

*Laboratories: Chicago, Ill., Baton Rouge, La., Farmington Hills, Mich. and Port Neches, Texas.*

## Financial & Protective Services

Inventory, consumer and commercial financing; leasing; credit insurance, property and casualty reinsurance; equity investment; field warehousing; transportation and traffic services. Armored car, guard and alarm services; early warning smoke and fire detection systems; dry chemical fire extinguishing agents; crowd control, janitorial and maintenance services.

**Borg-Warner Acceptance Corporation**  
*Chicago, Ill.*

**Arcadia National Insurance Company**  
*Chicago, Ill.*

**Borg-Warner Collateral Services**  
*Chicago, Ill.*

**Borg-Warner Credit Corporation**  
*Chicago, Ill.*

**Borg-Warner Equities Corporation**  
*Chicago, Ill.*

**Borg-Warner Leasing**  
*Chicago, Ill.*

**Borg-Warner Insurance Finance Corporation**  
*Chicago, Ill.*

**Centaur Insurance Company**  
*Chicago, Ill.*

**Creon Insurance Agency**  
*Chicago, Ill.*

**Borg-Warner Acceptance International**  
*Chicago, Ill.*

**Borg-Warner Acceptance Canada, Ltd.**  
*Willowdale, Ont.*

**Borg-Warner Acceptance Corporation (Australia) Ltd.**  
*Milsons Point, N.S.W., Australia*

**Borg-Warner Acceptance Corporation International, Ltd.**  
*Carolina, Puerto Rico*

**Borg-Warner Acceptance Ltd.**  
*Letchworth, Herts., England*

**Borg-Warner Financieringsmaatschappij, B.V.**  
*Amsterdam, Netherlands*

**Borg-Warner Finanzierungs GmbH**  
*Heidelberg, West Germany*

**S.A. Borg-Warner Acceptance Corporation N.V.**  
*Brussels, Belgium*

**Transportation Services**  
*Aurora, Ill.*

**Baker Industries, Inc.**  
*Parsippany, N.J.*

**Wells Fargo Alarm Services**  
*Horsham, Pa.*

**Wells Fargo Armored Service Corporation**  
*Atlanta, Ga.*

Wells Fargo Guard Services  
*Parsippany, N.J.*

Pyrotronics Division  
*Cedar Knolls, N.J. and Brewer, Me.*

Pyro Chem, Inc.  
*Boonton, N.J.*

Consolidated Facility Services  
*Sherman Oaks, Calif.*

## **Industrial Products**

Centrifugal, nuclear and submersible oil well pumps; mechanical seals; valves; agricultural equipment; power transmission products: timing chain, ball and roller bearings, motor drives, clutches and torque limiters; educational systems; hospital beds and patient room furniture.

Energy Equipment Group  
*Los Angeles, Calif.*

Byron Jackson Pump Division  
*Vernon, Calif. and Tulsa, Okla.*

Byron Jackson Argentina S.A.  
*Mendoza, Argentina (66%)*

Byron Jackson Co. S.A.  
*Mexico, D.F. and Santa Clara, Mexico*

Byron Jackson Division  
Borg-Warner (Canada) Limited  
*Scarborough, Ont.*

Byron Jackson Division  
Borg-Warner B.V.  
*Etten-Leur, Holland*

Ebara-Byron Jackson, Ltd.  
*Tokyo, Japan (50%)*

Thompsons-Byron Jackson  
Division  
Borg-Warner (Australia) Limited  
*Castlemaine, Victoria and Kewdale,  
Western Australia (77%)*

Davies and Baird Division  
Borg-Warner (Australia) Limited  
*Coburg, Victoria, Australia (77%)*

Centrilift, Inc.  
*Tulsa, Okla.*

Mechanical Seal Division  
*Temecula, Calif.*

Mechanical Seal Division  
Borg-Warner (Australia) Limited  
*Granville, N.S.W., Australia (77%)*

Mechanical Seal Division  
Borg-Warner B.V.  
*Etten-Leur, Holland*

Nuclear Valve Division  
*Van Nuys, Calif.*

Ingersoll Products Division  
*Chicago, Ill.*

Industria Metalmeccanica Ingersoll  
Apolo S.A.  
*Medellin, Colombia (50%)*

Ingersoll Agrometal S.A.C.I.  
*Monte Maiz, Cordoba, Argentina (48%)*

Morse Chain Division  
*Ithaca, N.Y.; Denver, Colo.; Aurora, Ill.;  
Keokuk, Ia.*

Morse Chain Division  
Borg-Warner (Australia) Limited  
*Condell Park and Punchbowl, N.S.W.,  
Australia (77%)*

Morse Chain Division  
Borg-Warner (Canada) Limited  
*Simcoe and Toronto, Ont.*

Morse Europe  
*Letchworth, Herts. and Stotfold, Beds.,  
England*

Tsubakimoto-Morse Co., Ltd.  
*Osaka, Japan (49%)*

Borg-Warner Educational Systems  
*Arlington Heights, Ill.*

Borg-Warner Health Products, Inc.  
*St. Louis, Mo.*

## **Transportation Equipment**

Products for original equipment manufacturers and the aftermarket: automatic, manual and marine transmissions; clutches; four-wheel drive units; differentials, brake components; axles; carburetion and ignition equipment; emission controls; radiators; automotive replacement parts.

Aisin-Warner Limited  
*Anjo City, Japan (50%)*

Automotive Parts Division  
*Franklin Park, Ill.*

Automotive Parts Division  
Borg-Warner (Canada) Limited  
*Mississauga, Ont.*

Automotive Parts Division  
International  
*Franklin Park, Ill.*

Borg-Warner de Mexico S.A.  
*Tlalneptla, Mexico*

Borg-Warner International GmbH  
*Hamburg, West Germany*

B-W Auto Parts of Puerto Rico, Inc.  
*San Juan, Puerto Rico (60%)*

Ballwin/Washington Division  
*Ballwin and Washington, Mo.*

Borg & Beck Division  
*Sterling Heights, Mich. and Chicago, Ill.*

Borg & Beck de Venezuela S.A.  
*Caracas, Venezuela*

Borg & Beck do Brasil  
*Sao Bernardo do Campo, Brazil*

Borg-Warner S.A. (Pty.) Ltd.  
*Uitenhage, C.P., Republic of South Africa (60%)*

Hydraulics Division  
*Wooster, Ohio*

Long Manufacturing Division  
*Burlington, Cambridge, Malton and Oakville,  
Ont.; Coldwater, Mich.*

Marvel-Schebler/Tillotson Division  
*Decatur and Dixon, Ill.; Blytheville, Ark.;  
Tralee, Ireland*

New Bedford Gear Division  
*New Bedford, Mass.*

Ottawa Division  
*Ottawa, Ill.*

Rockford Division  
*Rockford, Ill.*

Lemfoerder-Warner Mechanic  
GmbH  
*Hannover, West Germany (50%)*

Spring/Brummer Division  
*Bellwood and Frankfort, Ill.*

NSK-Warner K.K.  
*Fujisawa, Japan (50%)*



# The Businesses of Borg-Warner

Stieber Division der Borg-Warner GmbH  
Heidelberg, West Germany

Thomson & Scougall Division  
Borg-Warner (Australia) Limited  
St. Peters and Seven Hills, N.S.W., Australia (77%)

Transmission & Axle Division  
Borg-Warner (Australia) Limited  
Fairfield and Albury, N.S.W., Australia (77%)

Borg-Warner Automotive Services Ltd.  
Auckland, New Zealand (60%)

Parts & Service Division  
Borg-Warner (Australia) Limited  
Gladesville, N.S.W., Australia (77%)

Parts & Service Division  
Borg-Warner S.A. (Pty.) Ltd.  
Johannesburg, Republic of South Africa (60%)

Transmission Division  
Borg-Warner Limited  
Letchworth, Herts. and Chessington, Surrey, England; Kenfig, South Wales

Warneford Industries Division  
Borg-Warner (Australia) Limited  
Hornsby, N.S.W., Australia (77%)

Warner Gear Division  
Muncie and Auburn, Ind.

Warner Gear International  
Borg-Warner Limited  
Biggleswade, Beds., England

**Corporate Facilities**  
Borg-Warner Corporation  
Chicago, Ill.

Borg-Warner (Australia) Limited  
Fairfield, N.S.W., Australia

Canadian Corporate Office  
Toronto, Ont., Canada

U.K. Corporate Office  
Letchworth, Herts., England

Borg-Warner B.V.  
Amsterdam, Havens West, Holland

Borg-Warner K.K.  
Tokyo, Japan

Area Director—South America  
Sao Paulo, Brazil

# Borg-Warner Facts

Incorporated 1928  
Stock symbol BOR  
Traded—New York Stock Exchange  
Midwest Stock Exchange  
Pacific Stock Exchange  
London Stock Exchange

Vital statistics, 1978:	
Sales	\$2,326,000,000
Earnings	\$133,800,000
Earnings per share	\$6.24
Dividend per share	\$1.85
Number of shareholders (year-end)	55,900
Number of employees (average)	54,800

## For more information...

General information about activities of Borg-Warner Corporation, and a directory listing in detail all products and services currently offered, may be requested from the Communications Department, Borg-Warner Corporation, 200 South Michigan Avenue, Chicago, IL 60604.

Copies of our latest financial reports, and other information about Borg-Warner securities, may be obtained from the Office of the Secretary, at the same address.

For information about employment opportunities, you are invited to write to our Employee Relations Department, same address, or to the Personnel Director of any Borg-Warner division or subsidiary listed above.

Photography:  
pages 2-14, 16, 17, 19-21, 25, 29, 31, 33, 39, 45—Michael Maun  
pages 14, 15, 18, 24, 25, 27, 35-38, 40-44—Francois Robert  
pages 22, 23, 26, 34—Brian Seed  
page 28—Andrea Blanch  
page 30—Walter Iooss, Jr./Sports Illustrated  
Design by Boller/Coates/Robert, Chicago  
Printed in U.S.A. by Case-Hoyt, Rochester, N.Y.







**Borg-Warner Corporation**  
200 South Michigan Avenue  
Chicago, Illinois 60604

**AR32**

**1979 will be 4th record year in a row**

**Dividend raised 15%; 70% since 1975**

**Energy-saving motor speed control  
to debut in early 1980**



# Contents

---

New inverter technology sparks Borg-Warner drive in electronics	1
A view from inside: Condensed remarks by key company executives at a recent seminar for financial analysts	2
Recent performance measures up when compared with top-rated companies	10
Capital expenditure and depreciation review	12
On the way to a better business mix	13
A breakdown of sales by market	14
Fifteen-year financial summary (deflated data)	15
Fifteen-year financial summary	16
The management team: key executive biographies	18
The businesses of Borg-Warner	20
Investor relations and corporate disclosure policies	21

---

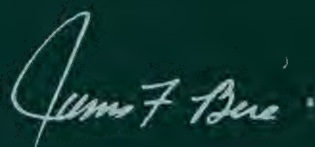
## Foreword:

---

To members of the financial community:

I hope this edition of the Investor Fact Book will help you better know our company and judge its potential.

As always, we welcome your comments on this or other of our communications and your suggestions on how we could better serve your information needs.



James F. Beré  
*Chairman and  
Chief Executive Officer*

November 1, 1979

# New inverter technology sparks Borg-Warner drive in electronics

Borg-Warner's new line of microcomputer-controlled variable speed motor drives promises to make "a significant contribution to our nation's drive toward energy conservation," according to James F. Beré, chairman and chief executive officer.

It also promises some exciting business opportunities for two Borg-Warner divisions—Morse Chain and York. Morse will offer a line of microcomputer-controlled alternating current (AC) inverters for use with 1-20 horsepower motors in the first quarter of 1980, and will expand the line to up to 50 horsepower by the end of the year.

The use of power transistors has enabled Morse to cut the cost of the inverter by 50%, making it competitive in cost with direct current controls, the type most commonly used by industry.

York has incorporated an energy-saving inverter control package into a new line of residential heat pumps, and has also packaged a unit for controlling the centrifugal chiller component of the commercial air conditioning system. Both systems will be available in early 1980.

The development also moves Borg-Warner toward a major objective—making good on opportunities to marry its experience in mechanical and hydraulic devices with its emerging skill in electronics.

## Broad industrial application

Basically, an inverter adjusts the power coming from a given electrical line so it matches the power needed by the motor it is feeding. Most motors in the United States run at fixed speed, and must be mechanically throttled if their speed is to be reduced. The throttling process results in energy losses.

Borg-Warner, based on work in its Research Center, has been in the inverter business for over 20 years. Until now, however, the inverter's high cost has limited its use. The use of proven electronics in its new products, Borg-Warner says, has driven down the cost and increased reliability.

According to Clarence E. (Red) Johnson, president and general manager of Morse,\* "the energy saved by using adjustable speed control in industry could be as high as one-third, depending on the application." Johnson cited fans, pumps and blowers as holding the greatest potential for energy savings.

Morse's inverter line, named the CF-1100, has use in a wide variety of other applications, including material handling, extruders, food and pharmaceutical packaging, drilling, textile machinery, printing, machine tools, paper converting and metal working equipment.

Johnson pointed out that the inverter could lead to further strides to keep pace with the increasing sophistication in manufacturing technology. One possibility is speed control for an entire plant. "We envision tying a number of speed controls to motors throughout a total system, and through a directly coupled central computer, controlling the overall process," he said.

"Estimates peg the market for adjustable speed controls for 1-50 horsepower motors at an annual growth rate of about 22% through the mid-eighties," Johnson noted.

## Commercial, residential air conditioning markets

For York, which was concerned with 'life cycle' air conditioning and heating costs long before energy was a national concern, the inverter control package is the latest in a series of product developments aimed at energy efficiency.

Over two years of testing show that the package, when applied to the centrifugal chiller of a commercial air conditioning unit, can save up to 30% of the energy consumed by the chiller. In addition to being offered as part of York's new commercial systems, the inverter control package will be provided on a retrofit basis for York or competitive equipment in existing buildings.

Béré noted that while York has only applied the inverter to the centrifugal chiller, which consumes around 30% of the energy used by the entire system, the division is working on control of the motors for blowers and recirculating pumps, which account for the remaining energy consumed.

Béré said that an inverter-controlled commercial system maintaining a building's temperature at 72 degrees could save more energy than a conventional commercial system operating at the 78-degree level mandated by the federal government as a summer standard for all office buildings.

With this in mind, Béré feels the new technology could spell relief "for

those of us who spent our office time in shirt-sleeves this summer," if government action is taken to grant users of energy-saving technologies an exemption from the 78-degree standard.

While York is optimistic about the inverter's performance in the new commercial building market, Jack W. Kennedy, York's president, sees the biggest market initially in retrofit installations. Kennedy estimates that the new technology could be applicable to as many as 30,000 existing buildings. Depending on the building, payback periods would range from three to seven years.

On the residential side, the application of the inverter to York's own line of energy efficient three-ton capacity heat pumps can save up to 17% of energy consumed. Kennedy noted that residential marketing efforts will be focused on the custom-built end of the home construction market.

## Energy savings immediately

Noting reports of other work being done in inverter technology, chairman Beré stressed that the company has set concrete dates for product availability. "We're talking about energy savings that can be realized almost immediately, not at some uncertain future date," he added.

Borg-Warner stressed that the technology was generated internally, and said that the company would not need any outside assistance to market or manufacture the products. The inverter and electronic controls for both York and Morse products will be manufactured by Borg-Warner Electronics, a collaboration between the two divisions, formed in 1977.

Thomas C. Jednacz, general manager of Borg-Warner Electronics and a key person on the inverter project since its inception in 1965, said that opportunities for the inverter don't end here. "We're looking at ways in which this technology can be applied in other areas of Borg-Warner," he said.

\*Now Borg-Warner vice president—human resources



# A view of Borg-Warner—from the inside

(Based on comments to security analysts at a meeting in Chicago earlier this year.)

The following is an update on Borg-Warner's businesses from both the corporate and operational points of view. It covers Borg-Warner's progress in reaching strategic planning goals, describes the company's planning process at work and reviews some key financial yardsticks. In addition, it contains in-depth remarks from the people who make the company tick—the presidents of key operating groups.

Depending on which economist you talk to, we're either heading for a recession, or are already there. Borg-Warner chairman James F. Beré is quick to point out the fundamental differences between the Borg-Warner of today and the company which dropped 38% in net earnings during the last recession.

**Béré:** "We've been very aggressively pursuing what we call our 'honing and divestment' program. The primary thrust of this program is to optimize our efforts in operating units that have high-growth potential. This has involved divesting of assets in marginal operations and targeting our capital allocations in those areas which promise the greatest rate of return."

Béré also points to the company's increasing emphasis on service businesses:

**Béré:** "We purchased Baker Industries two years ago, giving us a prominent position in a broad range of protective service markets. This acquisition, coupled with the continued success of our financial services subsidiary, Borg-Warner Acceptance Corporation, has had a strong effect on our profit picture."

Béré evaluates the opportunities posed by the current energy situation. In transportation:

**Béré:** "The redesign of cars to meet federally mandated fleet economy requirements provides us with enormous opportunities. Companies like Borg-Warner that can approach Detroit with sophistication in both marketing and product development will stand to gain in this type of environment."

A sign of this sophisticated approach in his own company, Beré feels, is Borg-Warner's relationship with Robert Bosch GmbH, the German high-technology firm. How does Borg-Warner's relationship with Bosch fit into this scenario?

**Béré:** "Many of us are convinced that the next major change in the transportation industry will involve the marriage of mechanical engineering with electronics. We believe there are opportunities to work together that could benefit both our companies and consumers, too."

What has happened since Bosch assumed a 10% equity position in Borg-Warner?

**Béré:** "So far, we have spent most of our time learning about each other's products and markets. In addition, we have a permanent task force charged with

determining areas of compatibility, which we feel are many. We *have* jointly purchased a share in American Microsystems, Inc., a California-based manufacturer of solid-state chips. We're now exploring ways their technology can improve a number of products."

Béré also sees further opportunity in air conditioning:

**Béré:** "York was designing systems for energy efficiency long before any real demand for this efficiency surfaced. As a result, for many purchasers, both residential and commercial, a York® system has traditionally been 'overdesigned.' The escalating cost of energy, however, has virtually played into York's hands, as consumers, consulting engineers and owners of commercial buildings are all thinking about how they can minimize energy consumption."

Béré also discussed growth opportunities associated with Hughes Tool, a company in which Borg-Warner holds an 18% equity interest:

**Béré:** "Our interest in Hughes was acquired in 1974 when we sold Hughes our own oilfield services operation, Byron Jackson, Inc. So, we continue to share in that growing part of the energy market through Hughes."

Is there another Firestone in Borg-Warner's future?

**Béré:** "Well, I can safely say that we are not actively *seeking* another Firestone. That was a special situation, one that we felt we had to pursue. Our *ideal* acquisition candidate would be in the service area, also, but it might be any company with a strong market position that would strengthen our present business areas. We would look for a company with a strong leadership position in its particular field, with management willing to stay and prosper under the Borg-Warner banner."

Robert O. Bass, the company's vice chairman, provides a description of the strategic planning system, established in 1975:

**Bass:** "First, we aimed at improvement of our existing businesses, emphasizing margins. Second, by analyzing strategic business units—SBU's as we call them—we would select the portions of our existing businesses which seemed to have better earnings and sales growth potential than the corporate average. These businesses would then be given a priority on capital resources. Third, we would plant the seeds for future high-growth businesses by acquiring or generating technology in these business areas. Finally, we would consider making a select number of acquisitions that would improve our 'business mix.'"

Bass elaborates on the second strategy—identification of high-growth businesses:

**Bass:** "...it is here where our people have really

gotten into the act. You see, the system dictates that the strategic planning process begin at the operating level. While we at corporate headquarters are analyzing in a broad sense what businesses we should be in, our divisional people are responsible for dividing their own operations into strategic business units. So, it's operations people who really begin the process of defining growth areas."

Bass claims that this process has helped build the character of Borg-Warner's operating managers:

**Bass:** "I know from years of experience that it's really rough to give up on a product or market strategy that you've nursed from conception. But that's what many of our managers had to do—sacrifice one part of their operation to nurture other, more profitable parts."

The trauma, however, was outweighed by the benefits:

**Bass:** "On the up side, our managers became more sensitive to market opportunities and have been quick to identify where investment in people, capital or technology could enable us to take advantage of these opportunities."

What about the prognosis on achieving the goal of reaching the median return of the *Fortune* "500"?

**James Deters, Vice president & controller:** "...this is a moving target, and whether we will break through the median by the end of the year is still a question. High inflation is putting Borg-Warner and other LIFO companies at a growing disadvantage by comparison as ROE measures are inflated by inventory profits. By reporting on LIFO, our relative position in ROE rankings suffers accordingly."

How has the company's rise from 471 in 1975 to 266 in the *Fortune* median return on equity rankings been accomplished?

**Deters:** "Better asset management has been our primary focus. Since 1971, we have divested operating assets equal to slightly more than \$200 million. Our working capital position has been further strengthened by our success in speeding up inventory turnover. Since 1970, we have increased turns from three to nearly four times, annually. We have substantially improved our receivables picture. Receivables were reduced from 65 days in 1970 to 55 days in 1975. We cut this further to 51 days by the end of last year. And that's about what we're averaging now. This performance is substantially better than our five-year plan goal, which was initially set at 55 days."

What kind of progress has been made on another long-range Borg-Warner goal, margin improvement?

**Deters:** "Improving operating margins has been a gnawing problem for Borg-Warner and one that grows more acute during periods of high inflation. But here,

too, we have made good progress. For 1978, our return on sales equalled 5.8%, a full point better than the median for the '500' industrials. Our improvement in this category has significantly outpaced the '500' since 1975; and last year, our 5% return on manufacturing operations alone exceeded the *Fortune* median for the first time in this decade."

William M. Valiant, Borg-Warner's vice president and treasurer, cites some other numbers that confirm Deters' assessment of the company's financial strength. Valiant is particularly proud of Borg-Warner's 20% debt-to-equity ratio, which is well within the company's self-imposed guideline of 35%.

**Valiant:** "We could raise an additional \$144 million through debt financing and still remain within that guideline. We project that we'll be able to exceed the \$200 million plus capital investment program over the next two years without increasing our debt."

But capital budgets are certainly not the only area in which Borg-Warner is showing its aggressiveness. Research and development is a vital factor in meeting strategic goals, as it provides the technological basis for penetration into growth market areas. William H. Weltyk, Borg-Warner's vice president of engineering and development, describes the ways that R&D dovetails with the four-part strategy outlined earlier by Bob Bass.

Cutting manufacturing costs is a major role for R&D—and a good way of improving the performance of present businesses, the first part of the plan:

**Weltyk:** "This can be done by finding less costly substitutes for present materials and by increasing the value-added of our products so they command higher prices without significantly higher production costs."

Weltyk points out that the second part of Borg-Warner's strategy, dividing operations into discreet units, gives R&D a basis for channeling time and dollars to the right places:

**Weltyk:** "This activity demands internal generation of technology in areas of promise and licensing of technologies in areas where we lack expertise. And, our research and development capability influences our acquisition strategy. Because our technological base is so broad, we may be able to enhance the R&D effort of a narrow-based acquisition candidate."

Weltyk feels that a good example of this seed planting program is Kemron Environmental Services. Kemron's major business is the monitoring of air quality at remote locations through a device known as a Kemputer™—a field-based data system:

**Weltyk:** "The development of the Kemputer was through a marriage of an acquired technological expertise and Borg-Warner's financial resources. With



# "ABS is not one plastic, but a family of plastics...each tailored to meet a specific need." Harvey

the proliferation of Environmental Protection Agency regulations, the monitoring business has grown dramatically during the 1970s. Kemron, despite its short life as a distinct entity, enjoys a technological leadership position in this market. The technology developed through Kemron will lead us into other growth opportunities."

Until now, we've heard from a number of corporate officials on the plans and aspirations they have for Borg-Warner. But the people charged with turning those aspirations into reality are the operating managers. Their thoughts follow.

First, Frank E. Pilling, corporate vice president (Transportation Equipment group—TEG), describes Borg-Warner's largest business segment:

**Pilling:** "Our 30 operating units, in some 44 worldwide locations, accounted for 37% of Borg-Warner's total sales and earnings for 1978. As a separate entity, the Transportation Equipment group would rank in the top 300 of the *Fortune* '500', with sales exceeding \$860 million..."

Pilling also points out that the group is far less dependent on the automotive industry than it is generally perceived to be:

**Pilling:** "While sales to automobile manufacturers are important to TEG, these sales represent only 41% of our total sales, and 35% of our total income."

The rest of the group's sales are evenly divided among manufacturers of trucks, off-highway and construction equipment, agricultural equipment, replacement parts and a category which includes recreational vehicles and marine equipment. Pilling notes the strong growth rate of the group's aftermarket business, which provides a counterbalance for his group's cyclical markets. The TEG chief expects aftermarket sales to double by 1982, using 1977 as a base year:

**Pilling:** "Our strength in the aftermarket centers on our worldwide distribution network which handles over 20,000 parts for nearly 3000 accounts in some 70 countries."

Pilling discusses research and development, where the emphasis is on fuel economy:

**Pilling:** "We have successfully introduced a new fan drive for medium- and heavy-duty trucks which uses a patented variable clutch. This unit is currently being tested on off-highway vehicles. The fan only operates when the engine requires cooling, which, on a truck, is usually less than 5% of the time... We've just started production on a new part-time four-wheel-drive transfer case for Ford light trucks. The unit weighs only 80 pounds, complete with lubricant; and the part-time feature means increased fuel economy.

We have a new automatic locking hub that is scheduled for standard equipment for late in the model year 1980 for a major manufacturer."

Pilling finds a good deal to be encouraged about with the group's unconsolidated operations overseas. The Japanese operation is beginning production of a new line of automatic transmissions for a major Japanese auto manufacturer. The transmission, which has an overdrive device, outperformed competing models. Pilling is particularly optimistic about a new clutch that the group's Brazilian plant will be producing for General Motors' new "J" car, the automotive giant's new entry into the world car market:

**Pilling:** "We are projecting strong sales for the new unit and feel the potential exists for supplying clutches to North and South America from that facility."

The group's United Kingdom transmission facility turned a profit in 1978 for the first time since 1971; West German operations and the Japanese joint ventures are also doing well. What about Mexico?

**Pilling:** "Recent fiscal policy changes by the Mexican government, an improved balance of payments situation, large oil and gas reserves and Mexico's proximity to the United States combine to make it an attractive expansion site. Several opportunities are under discussion."

Another topic Pilling likes to discuss is cost control, an area he feels might have been the main reason for increased earnings and a more favorable return on investment in 1978:

**Pilling:** "In 1978, the savings realized from cost reduction programs increased 32% from the previous year."

In its chemicals business, Borg-Warner has a manager whose pursuit of new market opportunities often has been as easy as A-B-S. The initials stand for acrylonitrile-butadiene-styrene, a versatile thermoplastic compound used in literally hundreds of applications. Leonard A. Harvey, president of Borg-Warner Chemicals-Americas, describes his company's market position:

**Harvey:** "In the U.S., ABS volume surpasses 1.1 billion pounds a year; and Borg-Warner supplies 40% of that volume."

He points out that not all ABS material is alike:

**Harvey:** "...ABS is not one plastic...it is a family of plastics. Borg-Warner has manufactured about 80 grades of ABS over the years, each tailored to meet a specific need."

Harvey points to three good reasons why his company is focusing its marketing efforts on specialty grades of ABS:

**Harvey:** "First, specialty materials yield margins two to three times higher than general purpose grades. Second, the use of special grades is growing faster than general purpose grades—for some ABS products, 20% a year. And third, plastics with the performance and economic benefits of Cycolac® ABS have only a small part of those markets currently."

Harvey assesses ABS' major markets. First, the automotive industry:

**Harvey:** "ABS has been used in automotive applications such as grilles and instrument clusters for many years. The trend to lighter, smaller cars will lead to a 330-million-pound-a-year market for ABS in Detroit by 1983."

Next is pipe, long a staple ABS market:

**Harvey:** "ABS applications in pipe now stand at some 300 million pounds a year."

Harvey estimates the refrigeration market will grow to 200 million pounds of ABS a year by the early 1980s:

**Harvey:** "These are big numbers for a material that sells for 50 to 80 cents a pound."

He evaluates Chemicals' position now as compared with its position during the last recession:

**Harvey:** "Our product mix is such that we are more strongly positioned in the higher margin, high-growth potential markets. This was not the case in 1975. It is true that to a large extent as the durable goods, automotive and construction indicators go, so go plastics. But we think our penetration in specialty areas provides a buffer."

How does the raw material situation look?

**Harvey:** "In terms of supply, we feel we're in much better shape than we were at the time of the last downturn. ... the competition between gasoline and petrochemicals demand is the cause of the current benzene shortage. It's also the reason that benzene prices have nearly doubled since the end of last year."

What about styrene?

**Harvey:** "Our styrene production is protected by a joint venture for styrene production with American Petrofina. The venture capacity there is over 1.3 billion pounds a year. This allows us not only to supply our own requirements for ABS (100% in the U.S. and Canada), but also allows us to satisfy some of our requirements in Europe, and to sell styrene to the merchant market."

The international situation looks much better than 1975, when the chemicals operation was saddled with overcapacity and cutthroat pricing competition:

**Harvey:** "Last year, Europe accounted for a \$4 million operating profit, as opposed to a \$5 million loss in 1977. That's a \$9 million turnabout—and a signifi-

cant part of that came through internal cost reductions. This year, we project even higher operating income, despite heavy startup costs incurred at our new Scotland plant, where we manufacture modifier resins for the PVC market."

Japanese and Australian operations are also looking very good, Harvey notes:

**Harvey:** "Our joint venture in Japan, Ube Cycon, is now making a good return on investment, as is our Australian operation. In fact, we announced at the end of May that we had bought out our Australian partner there, Nylex, Ltd."

On the domestic front, Harvey noted that his group would be building a \$50 million ABS plant in Port Bienville, Miss. The new plant, plus additions at five existing plants, will increase the group's domestic capacity 40% by 1982.

Through its York division, Borg-Warner is a leader in providing air conditioning and heating systems for residential, commercial, and industrial markets and in the manufacture of air conditioning compressors for automobiles and in commercial refrigeration equipment.

**Jack W. Kennedy, President of York division:** "Our equipment has been installed in systems in the World Trade Center in New York City, the Hilton Hotel in Hong Kong. ... Our products are making people comfortable while they check their bags at Orly or De Gaulle airports in Paris or attending a performance of the opera at Milan."

York products also keep a large number of Washington, D.C., regulators and legislators from getting too hot under the collar or overly chilled from the climate of public opinion. In fact, Kennedy claims that over 70% of all office buildings constructed in Washington over the past 15 years have York systems.

Kennedy comments on York's share in each of its major markets:

**Kennedy:** "In unitary air conditioning, we're number five, to Carrier's number one position, and GE is number two. In commercial air conditioning, we are number three, to Trane's number one, and Carrier is in second place. We are an industry leader in industrial refrigeration, in the highly technical applications for the chemical and petrochemical market, and we are the world's largest independent producer of automotive air conditioning compressors."

Much of York's reputation as a top-of-the-line manufacturer has been earned overseas, as 40% of York's production is for the international market. Of that 40%, 20% is exported from the U.S. Kennedy remarks that it is all part of the plan:

**Kennedy:** "Our marketing strategy has been



## "In 1976, only 18% of our system sales were applied to energy-efficient applications. Now it's 50%" Kennedy

put together so that we do have good export business production in the United States, which helps on any kind of a downturn that is U.S. economy oriented."

He points out, however, that exportation is only one part of a total international organization:

**Kennedy:** "The three major facets of York Europe are our operations in Basildon, England; in Nantes, France; and our joint venture with Brown-Broveri in Mannheim, Germany. In further support of the European operations we have plants in Durango and Monterrey, Mexico. The Monterrey plant is being replaced with a new plant scheduled for completion and production in the first quarter of 1980. And last, we have a facility in St. Jerome, Quebec."

He points to York's exceptionally strong European reputation:

**Kennedy:** "In Europe, we developed energy-saving systems that offset higher first costs with substantially lower operating costs; and we sold our customers on the concept of 'life cycle costing' while U.S. buyers were still basing their buying decisions on first cost."

Kennedy notes that U.S. buyers are now coming around to this concept:

**Kennedy:** "This is evidenced by the fact that in 1976, only 18% of our total system sales were applied to energy-efficient applications, where in 1978, this has grown to 50%."

Kennedy sees energy efficiency having a greater role in the company's maintenance and service operations, which influenced the development of a separate energy and maintenance division two years ago:

**Kennedy:** "We now obtain contracts that are based solely on increasing the equipment's operating efficiency, where in the past, the purpose of most maintenance contracts was to prevent breakdown and extend equipment life. In addition, we're now obtaining contracts to retrofit existing systems with more energy-efficient components, with the associated costs to the owner being offset by energy savings."

The industrial segment of Borg-Warner's business is primarily made up of the Morse Chain division and the Energy Equipment group. Morse Chain, which supplies industrial and automotive markets with a variety of power transmission products, sees continued growth despite the maturing of its markets:

**C. E. Johnson, President of Morse Chain\*:** "While profitability relates to the economic cycle, our industrial line does not react as sharply on the down side due to the moderating effect of our strong distribution base. Whereas equipment manufacturing

declines, industry continues to allocate funds for maintaining existing equipment and machinery. Although this in-plant activity does not totally offset capital spending slowdowns, it certainly tempers an overall business decline."

Johnson adds that Morse's strategy of emphasizing distributor business over original equipment manufacturers has lent further stability to the division's growth picture:

**Johnson:** "The emphasis on developing a strong distributor program has had the planned effect of shifting our sales mix from 45% distributor and 55% OEM in 1978 to 60% distributor and 40% OEM in 1979."

Morse now has 974 stocking distributors in the United States, a leadership position in the industrial products area. This is bound to have a positive effect on market share, as Johnson notes:

**Johnson:** "The served market share by our industrial SBU was approximately 13% in 1978, and we are forecasting an increase in share to 17.5% by 1983."

In the automotive market, Morse's big news is its Hy-Vo® chain, as Johnson notes:

**Johnson:** "Our Hy-Vo business has been given added thrust by the recent upgrading of Hy-Vo as part of our continuing product development programs. 'Hy-Vo® Lite', as we call it, has approximately 40% more loading capacity than earlier designs and is well covered by U.S. and foreign patents. Hy-Vo Lite has enabled us to use narrower chain in transmission and transfer cases, thereby helping to reduce size and weight and making a valuable contribution to fuel economy."

While sales of four-wheel-drive vehicles has suffered during the latest gasoline crisis, Johnson projects a solid future for these vehicles:

**Johnson:** "Manufacturers feel that when the government's energy policy has been established, and the situation stabilized, the long-term outlook will be bright."

Front-wheel drive, which used to be a novelty in the American automobile industry, is coming of age, as Johnson points out:

**Johnson:** "The front-wheel-drive market has just entered a dramatic growth stage with the recent introduction of the General Motors X-car line. Early response for the new cars has been excellent and has created significant demand for our Hy-Vo Lite chain. ... it has been estimated that by the late 1980s, over 75% of the cars that General Motors produces will be front-wheel-drive."

The other major component of the industrial products business is the Energy Equipment group, which designs, manufactures and markets pumps,

\*Now Borg-Warner vice president—human resources

valves, actuators and mechanical seals for the petroleum and power generation industries.

The largest of the four divisions in this group is Byron Jackson Pump. Borg-Warner believes this division is the largest centrifugal pump manufacturer in the world:

**Peter C. Valli**, corporate vice president (*Energy Equipment*): "We definitely have more primary coolant pumps in service than any other producer at this time. We have enjoyed a market share in primaries of about 60% of the available market."

The Nuclear Valve division, as the name implies, provides valves actuated by electric, pneumatic or hydraulic means for the nuclear industry. The Mechanical Seal division, an offshoot of Byron Jackson, makes products which mechanically prevent leakage at the rotating shafts of pumps and compressors. Finally, the Centrilift subsidiary makes submersible pumps used in the enhanced recovery of oil. Valli breaks down his group's major markets:

**Valli:** "Our products and services are dedicated to three major markets: petroleum, power generation and what we refer to as commercial... Petroleum represents the largest market for our products—51%. We serve the market subsegments of production, refinery, pipeline and petrochemicals."

What about power generation?

**Valli:** "The power market represents approximately 24%, which includes both fossil—that is, coal, gas and petroleum-fired plants—and nuclear power plants."

Valli notes that half of this market is in the United States, while the remainder is spread out overseas. He contends that the group has a very strong market position in the Far East and Canada, as well as the United States:

**Valli:** "Our third major market area, commercial, represents a tremendous potential market consisting primarily of agricultural, waterworks, general industry and other segments. About \$200 million of this market is in the United States, where Environmental Protection Agency regulations and clean water laws are having a positive impact on demand."

He claims that existing product lines represent a \$2 billion market, with real growth of 6 to 7% projected over the next five years. He further points out that while the group's major markets are cyclical, they tend to run in counter cycles, contributing to a consistent overall growth rate.

A good example of how different market segments offset each other is the power generation market:

**Valli:** "In spite of all the controversy, we believe

the electrical utility market in the United States will have to grow at a 4 to 4-1/2% rate through the year 2000. Unless you buy the notion of a 'no-growth' economy, we'll need the additional capacity."

Valli notes that his group's sales to electric utilities should continue steady improvement, as strength in the fossil fuel market will offset any roadblocks in the way of nuclear plant construction:

**Valli:** "The dollar value of business available in every nuclear plant is larger for us than in a fossil plant, but many more fossil plants will be built if nuclear construction continues to be impeded."

He sees the group barrelling along in the petroleum market, as well:

**Valli:** "Our present market share averages about 14 to 15%. We see the U.S. markets we serve as growing at about 8%... Mexico, incidentally, where we have an excellent position, will grow at a 12% level."

In the commercial area, he mentions some new things in the works:

**Valli:** "Commercial markets offer exceptional opportunities for us. Nineteen percent of our sales go to these markets, where we have a 12% share. Present activity includes a major reorganization, and plans for the construction of a new facility to produce pre-engineered pump products for commercial and utility markets in the United States and elsewhere."

Borg-Warner's service businesses, a growing element in the company's earnings picture, include Borg-Warner Acceptance Corporation (BWAC), a financial services subsidiary, and Baker Industries, a diversified supplier of protection services. Richard J. Doyle, BWAC president, describes the scope of his company's operations:

**Doyle:** "We do business with more than 1000 manufacturers and 35,000 retailers in the United States, Canada, Puerto Rico, Australia and Europe from over 350 locally managed offices."

Doyle comments on 1978, BWAC's 13th consecutive year of growth:

**Doyle:** "Our net earnings, \$15.3 million, were 10 times our earnings just 10 years ago. And our gross finance receivables, \$1.3 billion, were almost nine times greater last year than they were in 1968. As a result, our annual compounded growth in earnings since 1968 is 26.1%. That's almost four times greater than the average growth in earnings of 10 major non-captive finance companies from 1967 to 1977."

According to Doyle, two principles guide all BWAC activities:

**Doyle:** "First, we develop a strategic plan for each area of business for each year from the bottom up. Second, we provide prompt, efficient and intelligent



# "One in every five TVs, stereos, or home appliances sold in the U.S. is financed by BWAC" Doyle

local service to our customers."

Doyle believes that BWAC's involvement in financing television sets is a good example of how the company conducts its business in its oldest activity, inventory financing:

**Doyle:** "In the early 1960s, expensive color televisions presented a much greater sales risk to the retailer—and to BWAC. We measured our capabilities and the market's potential. We offered a distributor local service throughout his market area, which his bank couldn't provide. As an independent company, not a captive, we would serve all of the industry's manufacturers. We're now the industry leader in television floor planning; and one in every five televisions, stereos or home appliances sold in the United States is financed by BWAC at some time on its way from the factory to your home, or to mine."

Doyle assesses BWAC's ability to enter other markets and expand into other forms of financing:

**Doyle:** "Our leasing division established its first office in 1969. Our first international branch office opened in 1969, and we entered the agricultural equipment market in 1975. Each of those three areas of business today makes more profit for BWAC than the entire company did in any of its first 15 years."

He analyzes the future prospects for each of BWAC's four divisions. First, inventory financing:

**Doyle:** "We expect continued growth in all our inventory financing markets, from home entertainment equipment, to white goods, to agricultural. And we expect continued diversity. Just 10 years ago, for example, two-thirds of our branch offices were serving the inventory financing needs of just one manufacturer. Today, exclusive of Borg-Warner, less than one-twentieth of our total financing portfolio is represented by any one manufacturer."

How about insurance?

**Doyle:** "In insurance, the volume of insurance premiums we financed increased 72% last year, 118% in 1977. We anticipate more growth, though not at the same rates of gain, as more businesses look to the cash flow benefits of financing their insurance premiums. The continuing demand for consumer credit, which has doubled since 1973, will require a supporting growth in credit life, disability and property insurance—three of the insurance services we provide."

In retail financing?

**Doyle:** "We've just entered the marine industry, projected to become a \$9 billion industry by 1980. We plan to be serving at least 15 of our country's major markets for large sailboats and cabin cruisers through local offices by the end of this year."

In the leasing area, Doyle cites new programs:

**Doyle:** "The increasingly high cost of farm implements and other equipment frequently reaches or exceeds the lending limits of small- and medium-sized banks. Losing that opportunity to a larger bank can cost a small bank a customer and his basic business. Through a BWAC participating leasing program, one of BWAC's newest services, the bank can serve and keep its customer by lending up to its limit, then placing the remainder with us."

Now for an assessment of opportunities for Borg-Warner's newest major acquisition—Baker Industries. First, an analysis of the competition in several major markets and how Baker stacks up:

**Malcolm Baker, President of Baker Industries:** "Pinkerton is the largest guard organization in the United States and serves over 100 markets. Wells Fargo serves some 50 markets. American District Telegraph, the largest alarm company in the United States, is in over 100 communities—we are in 20. Purolator, the largest courier company in the United States, has revenues of over \$200 million. We have courier revenues of some \$15-20 million. So you see, there's plenty of room for growth."

What is Baker's verdict on the residential smoke detector market, a market burdened over the past two years with overcapacity and a surplus of competition?

**Baker:** "The timing and severity of the shakeout in the marketplace was far more severe than initially anticipated. It is our intent to participate in this market only on an economically viable basis. At some point in the future, we believe the substantial inventories at the retail level will dissipate and pricing will stabilize."

He points to legislation as providing hope for this market:

**Baker:** "Twenty-three states and the District of Columbia have adopted statewide mandatory smoke detector laws for new residential construction. Six states and the District of Columbia also require smoke detectors in existing residential structures under selected conditions."

And on the municipal level:

**Baker:** "Los Angeles, Atlanta, Boston and St. Louis are examples of larger cities that require smoke detectors in new or renovated residential structures."

Overall, Baker believes his company will grow at a faster rate than the industry. He cites recent history to back up his prediction:

**Baker:** "Specifically, in the courier business, the two largest factors have grown at an average rate of 18% and 12% in revenues over the past four years. Our courier business has had an average growth in this segment of 25%. Pinkerton, Wackenhut, and Burns,

our largest competitors in contract security guard work, have an average revenue growth in this area of only 6 to 8%. Ours has been 25%. In the alarm segment, the major competition has grown at a 9% rate. We've grown at 11%."

What of the future?

**Baker:** "The future includes serious consideration of complementary services such as executive protection, investigative services and a broad-based expansion of our courier services into general commodities."

Baker also mentioned acquisition as a means of enhancing his present services. Shortly after these remarks, he made good on those words by announcing the planned acquisition of Burns Electronic Security Systems, Inc., the domestic central station subsidiary of Burns International. The acquisition ties in with an area that Baker views with enthusiasm—the expansion of the role of central station operations:

**Baker:** "Rather than viewing this operation merely as a burglar and fire alarm service, one could and should view this operation as a 24-hour monitoring center with installation and service capability. Energy conservation and industrial process supervision are certainly areas of opportunity when you view a central station in this manner."

Now that the major operating groups have been covered, we'll close with an evaluation of the company's prospects within the overall business environment. First, what are some of the negative factors that could affect performance?

**James J. Gavin, senior vice president—finance:** "One is the disturbing escalation of industrial raw material prices, which has placed serious pressure on margins. These prices are also reflected on our bottom line in another manner—through our 'last-in, first-out' method of valuing inventories."

Another negative is what Gavin calls a crisis in consumer confidence:

**Gavin:** "One convincing piece of evidence for this crisis in consumer confidence is the declining housing market. We are predicting that housing starts will reach only 1.6 million units for the whole of 1979—almost a 20% downturn from the year before. The housing market, of course, has a ripple effect throughout other sectors of the economy."

On the plus side, there's capital spending, which is on the rise:

**Gavin:** "We see real growth in capital spending of 6 to 8% in 1979. While the pace should slow for 1980, we're still projecting real growth in the neighborhood of 2 to 3% next year."

Another plus is the continuing strength of econ-

omies outside the United States:

**Gavin:** "A major difference between the last recession and the one we appear to be entering is that this one is presently confined to the United States. Foreign economies, most notably Europe and Australia, have continued to look strong. Our overseas operations stand to prosper if this trend holds through 1980."

Gavin also cites the service sector as an area where Borg-Warner is gathering strength:

**Gavin:** "Baker showed overall improvement in the third quarter on a year-to-year basis and should be up for the year as a whole."



# Recent performance compares favorably with other top-rated companies

These charts compare Borg-Warner's relative performance since 1970 in nine key financial ratios with that of about 100 other companies whose debt is rated "A" by Moody's and Standard & Poor's and about 70 companies rated "AA" by these agencies. Borg-Warner itself has a split rating—"double A minus" by S&P, and "A" by Moody's. The charts also show the performance of the S&P 400 industrials during the same period.

In most of the charts, it would appear that Borg-Warner had down operating years in both 1974 and 1975. The sharp 1975 decline did result from the broad economic recession, but the dip in 1974 was due to our change to LIFO inventory accounting that year.

Net income as a percent of sales for Borg-Warner has shown steady improvement since the 1975 recession and now compares favorably with the other top-rated U.S. companies.

Return on equity has shown the same trend and is now at the highest level in more than 20 years. For the 12-month period ending September 30, 1979, Borg-Warner's return-on-average equity reached 15.4%.

Because of its low-debt position, Borg-Warner shows up much better, in relative terms, when measuring return based on average total assets. Return on this basis has more than doubled since 1975, and 1979 will show continued improvement.

Borg-Warner's performance is made more impressive when considering our low debt-to-equity ratio, which has been almost consistently below the average for top-rated companies. Current debt is about 22% of total equity. This leaves plenty of flexibility for acquisition opportunities.

The reinvestment rate has attracted increasing attention from analysts. As an indicator of its ability to sustain future growth, Borg-Warner now compares favorably when measured against other top-rated companies.

Borg-Warner's dividend policy is to pay out an average of about 40% of our earnings in the form of cash dividends. Since 1970, our payout has averaged 40.7%, although there have been some wide swings on a year-to-year basis.

In addition to maintaining a roughly 40% payout ratio, the company's dividend policy also calls for more regular and frequent dividend increases, as has been the case during the last four years.

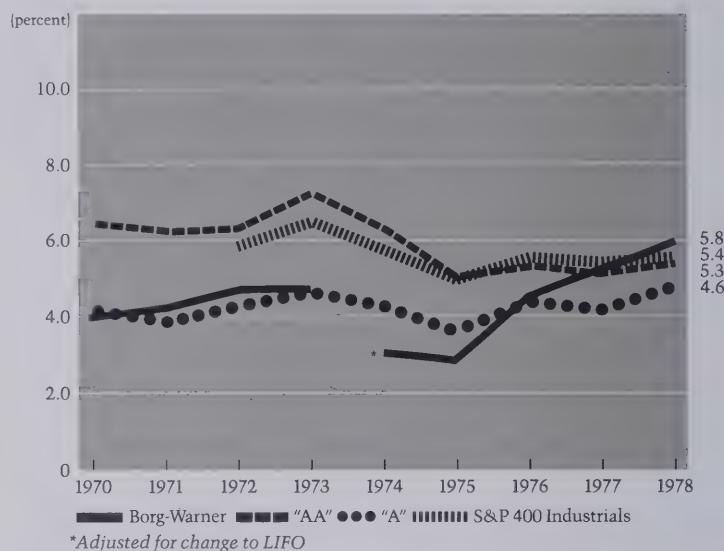
The dividend was increased to 57½ cents per share effective November 15, 1979. And since 1975, the dividend rate has risen 70%—from \$1.35 per share to the present \$2.30.

This dividend policy has resulted in a yield to Borg-Warner investors that over the years has been consistently above that of the average of both "A" and "AA" companies, and the S&P 400.

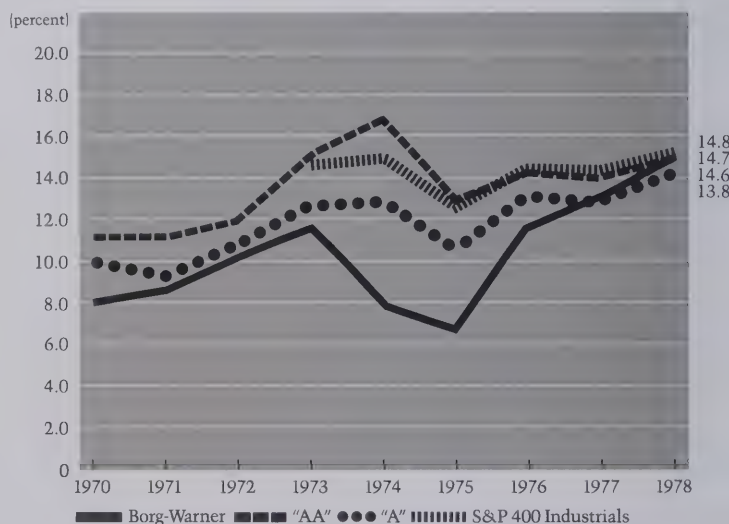
Unfortunately, the price/earnings ratio chart shows exactly the opposite picture. Borg-Warner's p/e has continued to be below that of the other top-rated companies. Perhaps Borg-Warner has deserved to sell at a discount in view of its cyclical performance and below-average return on equity of earlier years. Apparently, investors aren't yet convinced of the basic changes in our company.

The real test of our planning will come with the next economic downturn, which some economists say already has begun. But whatever shape a recession may take, we expect to come through it in a much better way than we did in 1974-75.

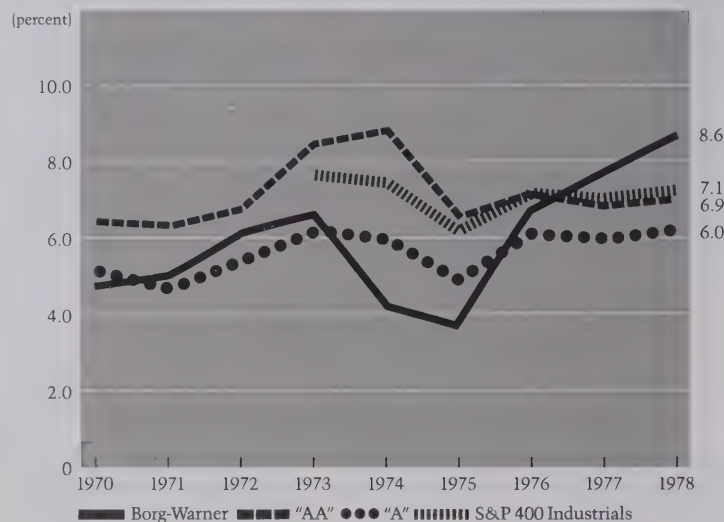
## Net income as a percent of sales 1970-1978



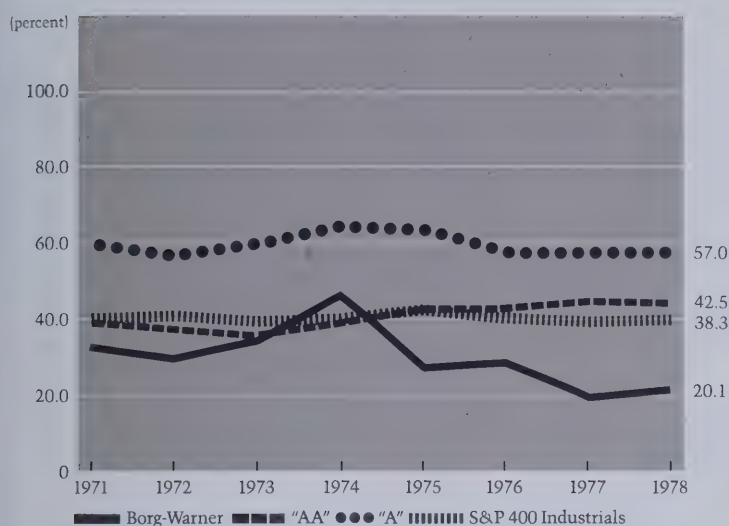
## Return on equity 1970-1978



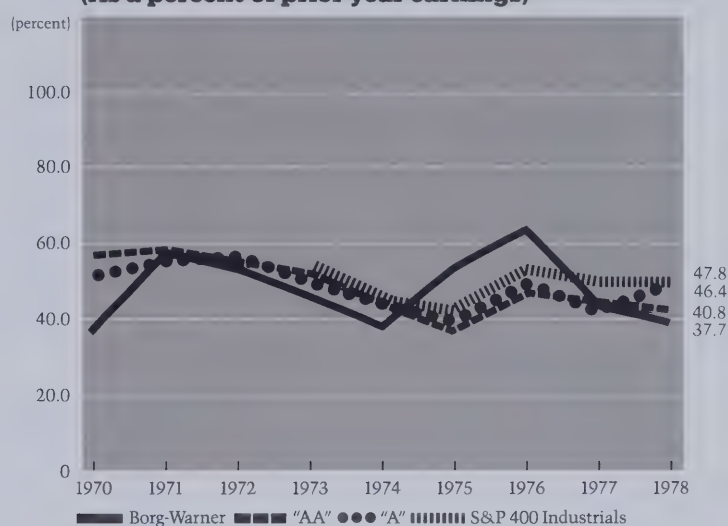
## Return on average total assets 1970-1978



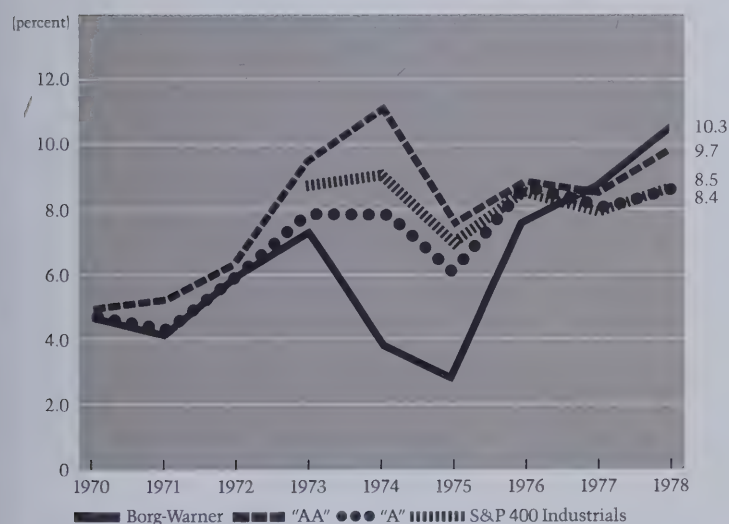
### Debt/equity ratio 1971-1978



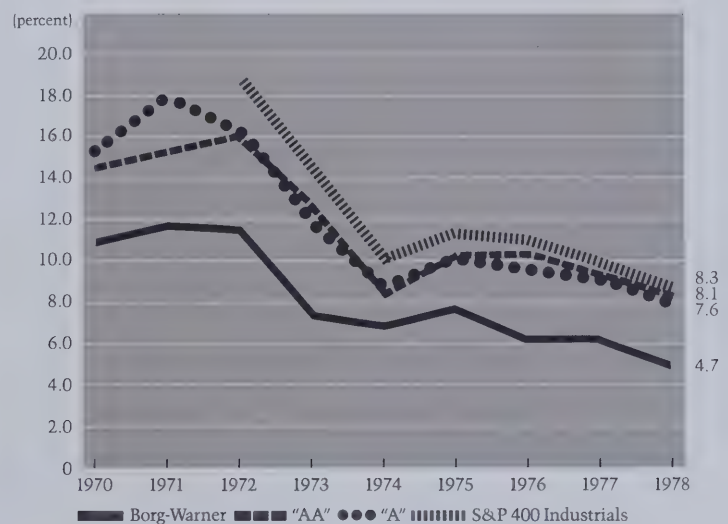
### Dividend payout 1970-1978 (As a percent of prior year earnings)



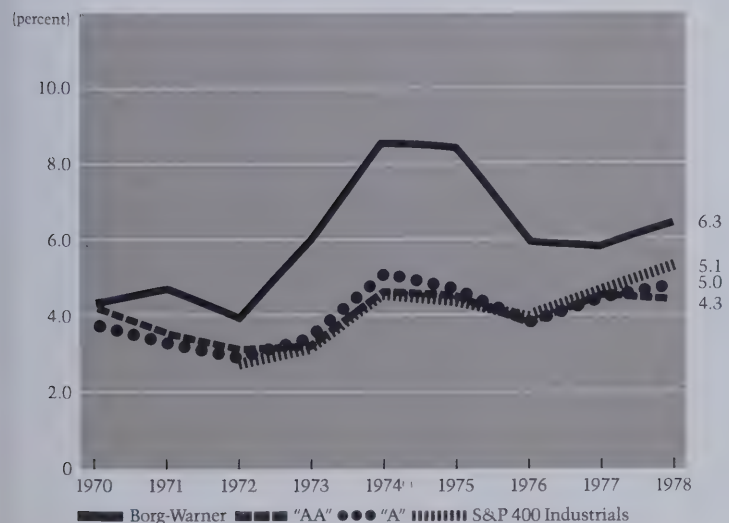
### Reinvestment rate 1970-1978



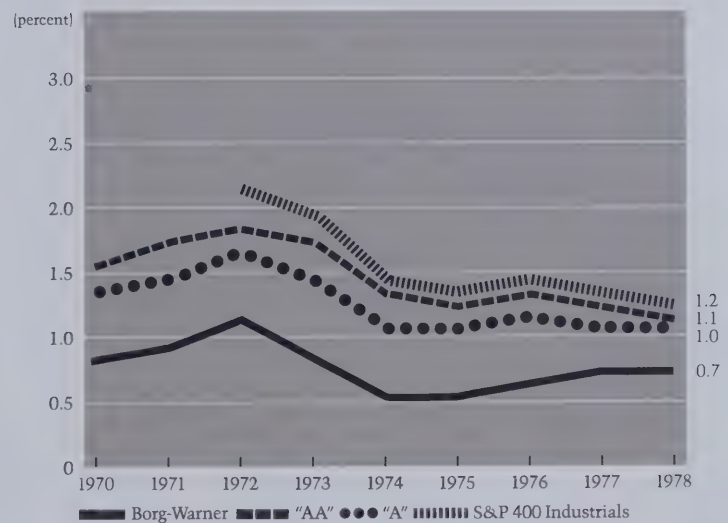
### Price/earnings ratio 1970-1978



### Dividend yield \*1970-1978



### Market price/book value 1970-1978



\*Dividend per share/avg. mkt. price



# Capital expenditures review

(millions)	Capital Expenditures				Depreciation	
	1974-1978		1979 Forecast		1974-78	
	Amount	%	Amount	%	Amount	Ratio
Groups						
Air Conditioning	\$ 36.8	10%	\$ 11.4	9%	\$ 25.8	1.4
Chemicals and Plastics	109.7	30	31.1	24	59.8	1.8
Industrial Products	77.2	21	33.9	26	41.0	1.9
Transportation Equipment	122.5	33	51.0	39	100.0	1.2
Corporate	21.0	6	2.6	2	8.8	2.4
Total Expenditures	\$367.2	100%	\$130.0	100%	\$235.4	1.6

## Geographic Breakdown

United States	\$251.9	69%	\$ 91.0	70%
Europe	72.3	20	22.0	17
Australia	19.8	5	10.3	8
Canada	15.0	4	4.7	4
Other Foreign	8.2	2	2.0	1
Total	\$367.2	100%	\$130.0	100%

## Type of Project

Renewal & Replacement	\$ 79.9	22%	\$ 30.4	24%
Cost Reduction	25.4	7	14.7	11
Other*	47.0	13	12.1	9
Total Standard	152.3	42	57.2	44
Expansion	214.9	58	72.8	56
Total	\$367.2	100%	\$130.0	100%

## Type of Assets

Land	\$ 3.1	1%	\$ 2.0	1%
Buildings & Land Improvements	92.8	25	28.0	22
Machinery & Equipment	271.3	74	100.0	77
Total	\$367.2	100%	\$130.0	100%

\*Primarily environmental and comfort/convenience items

## Borg-Warner Corporation sales, after tax earnings & capital expenditures by geographic segment 1971, 1974, 1978

(millions)	Sales			After-tax earnings			Capital expenditures		
	1978	1974	1971	1978	1974	1971	1978	1974	1971
Australia	\$ 143	\$ 133	\$ 78	\$ 6.5	\$ 4.0	\$ 2.0	\$ 5.8	\$ 5.9	\$11.8
Canada	107	90	45	4.4	5.7	2.1	2.9	2.8	.8
Europe	355	231	129	13.5	.7	2.7	35.7	16.5	14.5
Other	28	33	26	4.6	2.4	.7	.5	1.5	2.7
Total Non-U.S.	633	487	278	29.0	12.8	7.5	44.9	26.7	29.8
U.S.	1693	1281	870	104.8	38.0	39.9	70.4	56.3	25.4
Total	\$2326	\$1768	\$1148	\$133.8	\$50.8	\$47.4	\$115.3	\$83.0	\$55.2

# A better business mix

Business mix, a much-discussed concept, has particular significance for Borg-Warner.

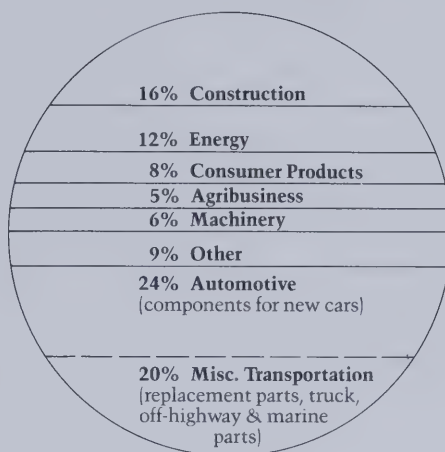
Borg-Warner sales and earnings historically have varied with fluctuations both in the overall economy and in specific markets, notably automotive. But expanding our stake in service businesses, which are affected by economic cycles to a lesser degree and by differently timed variables, establishes a "counter-cyclical" pattern that moderates the impact of business cycles. In addition, this expansion reduces our dependence upon the strength of the transportation market.

Our first such diversification was, into the financial area. Borg-Warner Acceptance Corporation, the flagship of our Financial Services group, was formed in 1953 and is now one of the 15 largest independent finance companies in the U.S. Last year was the 13th in succession of improved earnings for the group. At year end 1978, its receivables totaled \$1.4 billion—up 25% from the prior year. In the 10 years ended in 1977, the group's average annual compound earnings growth was 26%.

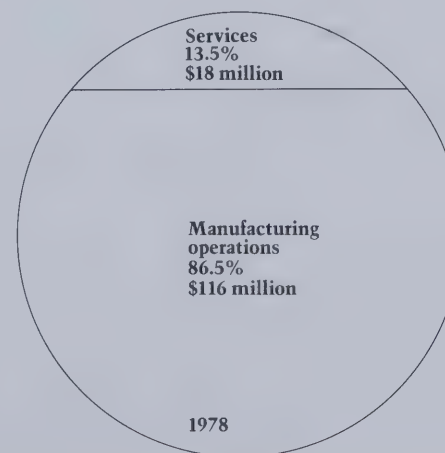
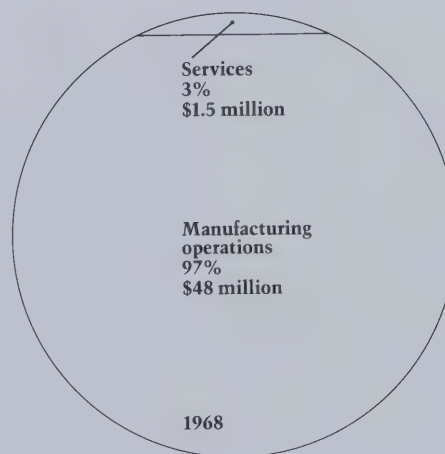
Baker Industries, whose acquisition was consummated in January, 1978, represents a significant enlargement of our service business. Baker, whose Pony Express corporate symbol enjoys wide recognition, has a robust balance sheet, a good earnings history and an able management team. And, as a supplier of guard, courier and armored-vehicle services as well as smoke and fire detection equipment and fire extinguishers, it has a strong position in markets whose cycles differ from those of our existing manufacturing businesses.

We are projecting that Financial Services and Baker, combined, will account for more than 15% of our 1979 net earnings. They will represent a smaller percentage of revenues, however, because margins are normally wider in services than in capital goods (service businesses have lower fixed costs). This solid position in services should afford us a buffer against economic downturns of the type that have hurt us in the past.

## Major Markets 1978 Sales



## Borg-Warner Net earnings



Borg-Warner manufactures products and components that serve the needs of 6 essential markets: automotive, construction, energy, consumer products, agribusiness and machinery.

Even though the broad automotive market continues to be the company's largest, Borg-Warner sales to automobile manufacturers for passenger car production account for less than one-quarter of total company sales. And in 1978, less than 20% of total sales were components for U.S. passenger car production.

This market breakdown does not include the company's growing revenues from financial and protective service operations which add to Borg-Warner's diversity.

One of Borg-Warner's major objectives is to increase its participation in the service sector of the economy as a means of reducing the impact of economic cycles on its performance.

Since 1968, the contribution to earnings of Borg-Warner's service businesses has grown from 3% to 13.5%, equal to \$18 million in 1978. In 1979, earnings from existing service operations will exceed \$25 million.

Through continued internal growth and further acquisition, the long-term objective is to derive about one-third of total company earnings from service operations.



# Sales by market

## Borg-Warner sales by market

(millions)	1978		1977		1976	
Automobiles	\$ 553	23.8%	\$ 483	23.8%	\$ 447	24.0%
Energy & Petrochemicals	271	11.6	253	12.5	238	12.8
Trucks & Off Highway	271	11.6	197	9.7	123	6.6
Consumer Products	193	8.3	157	7.7	148	8.0
Construction (industrial & commercial)	185	8.0	144	7.1	110	5.9
Housing	179	7.7	162	8.0	151	8.1
Replacement Parts	154	6.6	133	6.5	151	8.1
Machinery	134	5.8	126	6.2	107	5.7
Agribusiness (farm equipment & food processing)	124	5.3	142	7.0	141	7.6
Government Defense & Aerospace	71	3.1	62	3.1	60	3.2
Other	191	8.2	172	8.4	154	8.3
Discontinued Operations	—	—	1	—	32	1.7
Net Sales	\$2326	100.0%	\$2032	100.0%	\$1862	100.0%

## Air Conditioning group

(millions)	Total		U.S.		Non-U.S.	
	1978	1977	1978	1977	1978	1977
Housing	\$144	\$119	\$135	\$111	\$ 9	\$ —
Construction—Commercial	131	92	85	69	46	2
Automobiles	93	69	93	69	—	—
Construction—Industrial	42	43	12	12	30	3
Government & Defense	28	21	25	19	3	—
Energy—Petrochemical	15	20	12	15	3	—
Energy—Petroleum	13	15	10	14	3	—
Trucks	7	10	7	10	—	—
Agribusiness—Food Handling & Processing	5	10	2	4	3	—
Marine	5	10	5	5	—	—
Other	34	30	34	30	—	—
Total	\$517	\$439	\$420	\$358	\$ 97	\$ 8

## Chemicals & Plastics group

(millions)	Total		U.S.		Non-U.S.	
	1978	1977	1978	1977	1978	1977
Consumer Products	\$186	\$157	\$ 88	\$ 77	\$ 98	\$ 8
Automobiles	77	67	70	59	7	—
Energy—Petrochemical	39	39	39	37	—	—
Housing	35	41	25	30	10	1
Off-Highway Equipment	19	15	—	—	19	1
Agribusiness—Food Handling & Processing	16	17	2	5	14	1
Recreational Vehicles	9	8	8	7	1	—
Construction—Industrial	6	5	1	1	5	—
Agribusiness—Agricultural Equipment	3	4	3	4	—	—
Other	82	69	75	62	7	—
Total	\$472	\$422	\$311	\$282	\$161	\$14

# Sales by market

## Industrial Products group

(millions)	Total		U.S.		Non-U.S.	
	1978	1977	1978	1977	1978	1977
Machinery	\$114	\$106	\$ 84	\$ 75	\$ 30	\$ 31
Energy—Electric Utilities	96	68	77	57	19	11
Energy—Petroleum	87	86	62	70	25	16
Agribusiness—Agricultural Equipment	35	38	34	36	1	2
Automobiles	21	24	18	18	3	6
Energy—Petrochemical	17	21	7	5	10	16
Government & Defense	17	12	16	12	1	—
Aerospace	15	18	15	18	—	—
Replacement Parts	12	12	10	10	2	2
Off-Highway Equipment	9	3	1	1	8	2
Other	51	46	48	41	3	5
Total	\$474	\$434	\$372	\$343	\$102	\$ 91

## Transportation Equipment group

(millions)	Total		U.S.		Non-U.S.	
	1978	1977	1978	1977	1978	1977
Automobiles	\$362	\$323	\$178	\$154	\$184	\$169
Replacement Parts	142	122	126	108	16	14
Off-Highway Equipment	127	80	89	68	38	12
Trucks	107	85	102	80	5	5
Agribusiness—Agricultural Equipment	58	67	46	56	12	11
Machinery	20	20	14	18	6	2
Recreational Vehicles	17	4	16	4	1	—
Government & Defense	6	6	6	6	—	—
Aerospace	6	4	5	4	1	—
Marine	5	16	—	9	5	7
Other	13	9	9	2	4	7
Total	\$863	\$736	\$591	\$509	\$272	\$227

# 15-Year financial summary

## Deflated data (1965 constant dollars)

	Trailing 12 mos.														
	6/30/79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
Net sales	\$1151	1135	1064	1034	964	1126	1082	950	890	907	929	926	898	886	815
Net earnings	\$ 66.9	65.3	54.5	45.4	26.2	32.4	49.9	44.1	36.7	25.9	44.4	44.6	40.8	45.8	45.4
Earnings per share	\$ 3.12	3.04	2.58	2.33	1.36	1.69	2.59	2.24	1.90	1.34	2.26	2.24	2.17	2.42	2.47
GNP deflator index	\$ 2.20	2.05	1.91	1.80	1.70	1.57	1.43	1.35	1.29	1.23	1.17	1.11	1.06	1.03	1.00



# 15-Year financial summary

	Trailing 12 mos. 6/30/79	1978	1977	1976	1975
	<i>(millions except per share; individuals in thousands)</i>				
Net sales	\$2533	\$2326	\$2032	\$1862	\$1639
U.S.	1840	1693	1497	1336	1161
Non-U.S.	693	633	535	526	478
Net earnings	147.2	133.8	104.0	81.7	44.5
U.S.	118.5	109.9	99.2	78.4	38.2
Non-U.S.	28.7	23.9	4.8	3.3	6.3
Net earnings per share	6.87	6.24	4.93	4.21	2.31
Return on sales (net)	5.8%	5.8%	5.1%	4.4%	2.7%
U.S.	6.4%	6.5%	6.6%	5.9%	3.3%
Non-U.S.	4.1%	3.8%	0.9%	0.6%	1.3%
Return on capital (debt plus equity)	13.3%	12.9%	11.1%	9.9%	6.2%
Return on average equity	15.3%	14.6%	12.9%	11.4%	6.6%
Reinvested earnings as % of equity	10.4%	9.8%	8.0%	7.3%	2.6%
Shareholders' equity	1011	966	872	742	689
Total debt	161	195	171	206	181
Short-term	67	31	24	36	18
Long-term	94	164	147	170	163
Debt-to-equity ratio	16%	20%	20%	28%	26%
Total debt to total capital	14.2%	16.8%	16.4%	21.7%	20.8%
Current assets	849	789	649	688	590
Current liabilities	433	388	315	319	244
Net working capital	416	401	333	370	346
Working capital turns	6.1	5.8	6.1	5.0	4.7
Current ratio	1.96	2.03	2.06	2.16	2.41
Capital expenditures	110	115	77	36	50
Depreciation	56	55	51	43	43
Capital expenditures times depreciation	2.0	2.1	1.5	.8	1.3
Interest and finance charges	29.6	26.7	25.8	26.0	36.5
Interest coverage	12.6	13.3	13.5	9.3	3.1
Effective tax rate	42.4%	43.2%	43.9%	48.5%	36.5%
Inventory	370	369	335	339	331
Inventory turns	4.1	3.9	3.7	3.6	3.1
Receivables	381	296	259	210	181
Days' sales in receivables	50	51	50	50	50
Stock price					
High	34-3/8	34-3/8	33-7/8	30-3/8	21-3/4
Low	26	26	25-1/4	19-7/8	13-1/4
Price earnings ratio (average)	4.3	4.7	5.7	6.7	7.1
Yield (average)	6.6%	6.3%	5.9%	5.0%	7.6%
Book value per share	47.91	45.64	41.10	38.36	35.51
Shares outstanding (average, fully diluted)	21.4	21.4	21.1	19.4	19.4
Dividends per share (paid)	1.95	1.85	1.65	1.41	1.31
Dividend payment ratio	.28	.30	.33	.33	.51
Shareholders (year end)	54.2	55.9	57.0	58.6	63.1
Employees (average)	55.4	47.0	38.9	38.9	39.1

# After extraordinary items, net of income tax, of \$260 thousand or one cent per share of common stock. ‡ Interest, net.

1974	1973	1972	1971	1970	1969	1968	1967	1966	1965
\$1768	\$1547	\$1283	\$1148	\$1115	\$1087	\$1028	\$ 952	\$ 913	\$ 815
1281	1143	971	870	890	890	874	834	846	758
487	404	312	278	225	197	154	118	67	57
50.8	71.3	59.5#	47.4	31.8*	52.0	49.5	43.2	47.2	45.4
38.0	59.6	51.1	39.9	27.0	46.1	44.2	40.7	44.0	42.1
12.8	11.7	8.2	7.5	4.8	5.9	5.3	2.5	3.2	3.3
2.66	3.70	3.03#	2.45	1.65*	2.65	2.49	2.30	2.50	2.41
2.9%	4.6%	4.6%#	4.1%	2.9%*	4.8%	4.8%	4.5%	5.2%	5.6%
2.9%	5.2%	5.3%	4.6%	3.0%	5.2%	5.1%	4.9%	5.2%	5.6%
2.6%	3.0%	2.6%	2.7%	2.1%	3.0%	3.4%	2.1%	4.8%	5.8%
7.3%	9.8%	8.6%	7.2%	5.3%	8.1%	8.4%	—	—	—
7.7%	11.4%	10.0%#	8.4%	5.8%*	9.8%	9.6%	9.1%	10.3%	10.4%
3.7%	7.0%	5.7%	4.0%	2.4%	5.0%	4.3%	4.5%	4.5%	5.5%
670	642	610	575	553	544	528	484	467	447
302	215	174	183	207	208	147	131	68	29
55	79	33	34	63	67	52	44	63	24
247	136	141	149	144	141	95	87	5	5
45%	33%	29%	32%	37%	38%	28%	27%	14%	6%
31.0%	25.0%	22.2%	24.2%	27.2%	27.7%	21.7%	—	—	—
688	642	528	502	522	537	468	450	413	384
264	291	188	169	195	221	171	164	189	134
423	351	340	333	327	316	296	286	224	251
4.2	4.4	3.8	3.4	3.4	3.4	3.5	—	—	—
2.60	2.20	2.81	2.98	2.68	2.43	2.73	2.74	2.18	2.88
83	70	63	55	70	52	45	62	66	45
43	41	37	35	33	31	29	25	22	22
1.9	1.7	1.7	1.6	2.1	1.7	1.6	2.5	3.0	2.0
38.1	21.7	17.1	17.4	19.6	9.1‡	6.7‡	6.1‡	2.7‡	1.8‡
3.4	8.9	9.5	7.6	5.6	9.9	10.7	—	—	—
33.8%	48.8%	47.0%	45.9%	53.8%	49.5%	46.2%	44.9%	45.6%	43.7%
443	372	298	289	297	282	240	236	225	196
3.0	3.6	3.4	3.2	3.1	3.5	3.5	3.3	3.4	3.4
200	221	189	179	176	206	170	168	153	137
55	59	61	62	65	60	58	63	58	58
22-5/8	36-5/8	38-5/8	32-1/4	29-5/8	36-1/8	39-1/2	30-3/8†	25†	27-1/8†
12-1/2	17-1/8	29-1/4	23-3/4	18-1/8	22-1/2	25-7/8	18-7/8†	18-3/8†	22-3/4†
6.4	6.7	11.2	11.6	14.1	10.9	12.6	12.0	8.6	10.3
7.8%	5.5%	3.7%	4.4%	5.4%	4.3%	4.0%	4.0%	5.1%	4.4%
34.63	33.47	30.93	29.40	28.20	27.49	26.10	25.84	24.68	23.55
19.1	19.3	19.6	19.3	19.3	19.6	19.9	18.8	18.8	18.7
1.35	1.35	1.25	1.25	1.25	1.25	1.25	1.10	1.10	1.10
.51	.36	.41	.51	.76	.47	.50	.48	.44	.46
63.7	61.6	60.8	64.3	67.0	65.7	66.7	67.9	69.9	65.3
46.5	46.3	42.9	41.4	43.4	41.6	39.6	38.9	38.2	35.9

\* After extraordinary items, net of income tax, of \$11.7 million or 60 cents per share of common stock. † Adjusted for 2-for-1 stock split.



# The Borg-Warner management team

(Background data on the Borg-Warner executives financial analysts are most likely to meet.)

## **James F. Beré**

*Chairman and  
Chief Executive Officer*

His business experience particularly suits Jim Beré to his present post; he's twice headed manufacturing operations.

Before joining Borg-Warner in 1961 as president and general manager of the Borg & Beck division, Jim was president of U.S. Industries' Axelson Manufacturing division. Elected Borg-Warner president and a director in 1968, he assumed the CEO post in 1972 and the chairmanship in 1975.

Jim's directorships include Abbott Laboratories; Continental Illinois National Bank and Trust Company of Chicago, and its parent company; Hughes Tool Company; Northwest Industries; Time, Inc.; and Illinois Bell Telephone Company.

He is a native Chicagoan and holds a bachelor's degree in industrial engineering (1946) and a master's in business administration (1950) from Northwestern University.

## **Robert O. Bass**

*Vice Chairman and  
Chief Operating Officer*

Bob Bass' Borg-Warner career might be said to date from his first summer job with a Denver machine shop. By the time that company, Eberhardt-Denver, was acquired by Borg-Warner's Morse Chain division in 1956, he was a principal owner and became Morse's president in 1958.

He was elected a group vice president in 1966, executive vice president-industrial equipment in 1968, executive vice president of the Transportation Equipment group in 1973 and the latter's president in 1974. In 1975 he was named president and chief operating officer, and was elected to the newly-created vice chairmanship in 1979. He has been a director of the corporation since 1973, and is a director of SCM Corporation and The Raymond Corporation.

Bob received a bachelor's degree in business administration from the University of Denver in 1941.

## **Jerry E. Dempsey**

*President*

Elected president in 1979, Jerry Dempsey oversees operations of the Chemicals and Plastics and Transportation Equipment groups.

Jerry started with the York division in 1956 as a student engineer and has spent most of his Borg-Warner career with York. He also has served as executive assistant to chairman Jim Beré, as vice president in charge of the Chemicals and Plastics group. He was named executive vice president in 1978.

Jerry holds a bachelor's degree in mechanical engineering from Clemson University (1954). He later attended the University of Chicago and Georgia State College, where he received a MBA degree in 1968.

He is a director of Ube Cycon and Cos-Mar, both Borg-Warner joint ventures, and of the National Association of Manufacturers.

## **James J. Gavin, Jr.**

*Sr. Vice President-Finance*

Jim Gavin has been Borg-Warner's top financial officer since he joined the company in 1968 as vice president-finance. He has been a director since 1969.

Jim is a director of Arkwright-Boston Insurance and a member of its Midwest Advisory Board. He is also a director of BW Steel, Inc. and of Chicago Economic Development Corporation (CEDCO). He serves as board chairman of the latter's affiliate, CEDCO Capital, which provides venture capital to small, especially minority-owned, businesses.

After World War II service, Jim attended the Wharton School of Finance of the University of Pennsylvania, which awarded him a bachelor's degree in 1949. He completed the Harvard Business School's Advanced Management Program in 1961.

## **Donald W. Collier**

*Sr. Vice President-Corporate Strategy*

By both education and work experience, Don Collier is consummately equipped to coordinate Borg-Warner's technological planning. He was named to his current position in 1978, having been vice president-technology.

He joined the company in 1960.

His present responsibilities include counseling Borg-Warner's top management on matters of technology, strategic planning and corporate development.

Before joining Borg-Warner, Don was president of McGraw-Edison Company's Thomas Edison Research Laboratory and, earlier, a chemical engineer and research chemist for Sharples Corporation. He worked on the Manhattan Project in 1944-45.

Don holds an undergraduate degree from Catholic University in Washington, DC, and a master's degree in chemical engineering and a PhD in physical chemistry, both from Princeton.

## **Russell J. Parsons**

*Sr. Vice President,  
General Counsel and Secretary*

Russ Parsons' professional life has been spent with Borg-Warner. After a wartime stint (1942-46) with the U.S. Marine Corps Reserve, he joined the company's legal department in 1946. He was named to his present position in 1976.

He holds memberships in several business and professional organizations, including the American, Illinois and Chicago Bar Associations, the Legal Club of Chicago and the Law Club of Chicago. He has served as vice president, director and Chicago chapter president of the American Society of Corporate Secretaries.

Russ earned a bachelor's degree (1940) and a law degree (1942) from the University of Chicago.

## **Elmer D. Robinson**

*Executive Vice President*

Robbie Robinson's charge is group officer for the Morse Chain division of the Industrial Products group and the Air Conditioning group.

Robbie's association with Morse Chain goes back to his beginnings with Borg-Warner; he joined the company in 1955. He was made a Borg-Warner vice president in 1975.

He is a director of Applied Electronics Corporation, a joint venture of Borg-Warner and Robert Bosch North America; and of American Microsystems, Inc. Robbie holds a bachelor's degree in business administration from Rutgers.



**Robert E. LaRoche**

*Vice President,  
Chairman, Borg-Warner  
Acceptance Corporation*

Bob has steered the Financial and Protective Services group into an exciting era with its 1978 acquisition of Baker Industries. He has been with Borg-Warner Acceptance Corporation (BWAC), the largest unit in the group, almost since its 1953 inception.

He came to BWAC as its first branch manager in 1955. He was named BWAC chairman in 1971 and a vice president of Borg-Warner in 1975.

Bob attended Washington University in St. Louis.

**Frank E. Pilling**

*Vice President,  
President,  
Transportation Equipment group*

As operating head of the Transportation Equipment group, Bud Pilling is very much in the spotlight. His group's sales are the largest among Borg-Warner segments, and its products are those for which the company is best known worldwide. He has been a Borg-Warner vice president since 1974 and president of the Transportation Equipment group since 1975.

Currently, Bud is a director of the Wagner Castings Company and the Motor Equipment Manufacturers Association, and a trustee of Milliken University.

Bud received a bachelor's degree in mechanical engineering from California State Polytechnic College in 1950.

**Peter C. Valli**

*Vice President*

Peter Valli heads the Industrial Products group divisions that sell directly to the energy market. These are Byron Jackson Pump, Nuclear Valve and Mechanical Seal.

Peter's Borg-Warner career began in 1959 at what is now the Nuclear Valve division. Appointed assistant to the president of Borg-Warner in 1968, he was made vice president-management services in 1972 and assumed his present post in 1975.

Trained as an attorney, Peter is a member of the Massachusetts Bar Association.

Following World War II Navy service, Peter attended Colby College in

Waterville, Maine, and later received a juris doctor degree from Boston University Law School.

**James R. Deters**

*Vice President and Controller*

As former controller of Borg-Warner's Automotive Equipment and Industrial Products groups, Jim Deters is sensitive to the need for maintaining line management's decision-making latitude without sacrificing corporate-wide control.

He's been the corporation's controller since 1975, and has held financial positions with The Procter and Gamble, Boise Cascade, and Trans Union Corporations. He is a frequent lecturer for the American Management Association. He is a member of the Financial Executives Institute's financial accounting and reporting committee.

Jim was educated at Ohio University (bachelor's degree in finance and business, 1959) and Ohio State University (master's in business administration, 1963).

**William M. Vallant**

*Vice President and Treasurer*

Bill Valiant has made Borg-Warner his career; 1979 marks his 31st year with the company. He arrived as a junior accountant in 1948, and became treasurer in 1968, and a vice president in 1978.

Valiant, in managing the worldwide "bank" of the corporation, is responsible for assessing Borg-Warner's financial needs and arranging appropriate capital to meet those needs.

He holds a bachelor's degree in accounting from the Walton School of Commerce and also attended Northwestern University.

**William H. Weltyk**

*Vice President—Engineering &  
Development*

Bill Weltyk has been a Borg-Warner vice president since 1974. He was given responsibility for corporate engineering and product development in mid-1978.

He began his Borg-Warner career in 1959 as a sales engineer for the Borg & Beck division in Michigan. Bill received a bachelor's degree in mechanical engineering from Wayne State University in 1956.

**Other key officers:****C. E. (Red) Johnson**

*Vice President—Human Resources*

**Robert A. Morris**

*Vice President—Communications*

**Donald C. Trauscht**

*Vice President—Business  
Development and Acquisitions*

The average Borg-Warner service among this group of executives is 21 years.

**Management Committees****Policy and Planning  
Committee**

*James F. Beré, Chairman  
Robert O. Bass  
Donald W. Collier  
James J. Gavin, Jr.  
C. E. Johnson  
Russell J. Parsons  
Elmer D. Robinson*

**Operations Committee**

*Robert O. Bass, Chairman  
Jerry E. Dempsey  
James R. Deters  
Robert E. LaRoche  
Frank E. Pilling  
Elmer D. Robinson  
Peter C. Valli*



# The businesses of Borg-Warner

Most Borg-Warner products are components used in items manufactured and sold by other companies.

Millions of telephones, for example, are molded of Borg-Warner's Cyclocac® ABS thermoplastic. Thousands of motorists drive cars equipped with Borg-Warner transmissions. And hundreds of the world's large buildings are cooled with equipment from York®.

Borg-Warner has some 50 major divisions with operations in 20 countries on 6 continents. These operating units are organized into five product and service groups based on similarity of products or technology, and not necessarily the markets served. The five groups include:

## Air Conditioning

The York division is a major manufacturer of engineered air conditioning systems for large buildings and industrial refrigeration equipment for the petrochemicals, food and other process industries. It also produces commercial air-conditioning equipment for smaller office buildings, schools, hotels, factories, and apartment buildings.

A growing part of York's business is in central residential air-conditioning systems. In addition, it manufactures residential furnaces and automotive air-conditioning compressors.

## Chemicals and Plastics

Cyclocac® brand ABS is the trade name for a wide range of tough, engineering thermoplastics produced and marketed around the world by Borg-Warner Chemicals. The group also manufactures and markets a full line of Blendex® impact modifiers used for upgrading the physical properties and processing characteristics of PVC and other plastics.

Borg-Warner Chemicals also is in the fine chemicals business with a growing line of intermediates, additives and alkyl phenols.

## Markets served by each major product or service area

	Automobile	Commercial construction & housing	Consumer products	Energy	Agribusiness	Government & defense	Industrial machinery	Wholesale, commercial, consumer & lease	Armored car, guard & alarm service
Transportation Equipment	●				●	●	●		
Air Conditioning	●	●		●	●	●			
Chemicals and Plastics	●	●	●	●	●				
Industrial Products	●			●	●	●	●		
Financial & Protective Services								●	●

## Financial and Protective Services

The 1978 acquisition of Baker Industries, with its well-known Wells Fargo protective-services unit, brings added excitement to this group. Baker's six divisions provide the broadest range of protective services and products in the security field.

Borg-Warner Acceptance Corporation remains the group's major services unit. Today, it offers these financial services: wholesale, retail and receivables financing; personal loans; credit life, disability and property insurance; and vehicle and equipment leasing.

## Industrial Products

This is the most diversified of the five product and service areas. Major products of this group are: centrifugal pumps for power plants, pipelines and water plants; submersible oil well pumps; precision seals for pumps and compressors; valves; chains, bearings and power transmission products.

Other products include: agricultural discs, hospital furniture, and audio-visual educational systems.

## Transportation Equipment

The leading independent producer of automatic transmissions, supplies automatics to major car and light truck manufacturers outside the U.S. The company's five-speed manual transmission with overdrive was the first mass-produced in the U.S.

In addition to transmissions, other components include clutches, four-wheel-drive units, spin-resistant differentials, axle assemblies, propeller shafts, carburetion and ignition equipment, radiators and other heat exchangers.

A broad range of other equipment comes from Borg-Warner, including clutches, four-wheel-drive units, radiators, and replacement parts in passenger cars, trucks, off-highway and farm equipment, boats, aircraft, recreational vehicles and industrial machines.



# Investor relations and disclosure policy

**Objectives.** Borg-Warner's investor relations program aims to provide the information investors, both personal and professional, need to make informed decisions. To that end, we release, widely and promptly, any information that can reasonably be expected to affect the market value of Borg-Warner stock, or investor's attitudes toward it. This is accomplished by news releases, annual and quarterly reports and the *Investor Fact Book*; through in-person meetings with shareholders, security analysts and the news media. We also answer reasonable questions of a non-material nature from the latter groups, within the limits of confidentiality. When we do answer such queries, we do not feel obliged to pass on the information to others who haven't specifically asked for it.

**Spokesmen.** Investors, analysts and reporters sometimes want to speak directly with our operating officers; and we make them available as schedules permit. To reduce the need for such contacts, however, we normally schedule several occasions a year when interested groups can meet company officers personally. Our officers appear only at meetings open to the press.

We've designated company contacts for the professional investment community, shareholders and the news media:

Financial Community  
William Valiant, 322-8700  
Terry Wilson, 322-8672  
James Gavin, 322-8517  
Daniel Stepanek, 322-8674

Shareholders  
Dorothy Flynn, 322-8563  
Russell Parsons, 322-8530  
News Media  
Harlan Teller, 322-8676  
Patricia Brozowski, 322-8677  
Terry Wilson, 322-8672

We suggest that analysts who don't regularly follow Borg-Warner first contact Terry Wilson, the director of investor relations. Registered representatives should contact Daniel Stepanek.

No other Borg-Warner employee is authorized to answer inquiries or discuss the financial or operating affairs of the corporation with members of the financial community without prior approval of one of the above named persons.

**Projections.** We don't regularly make earnings forecasts, but we will make earnings projections when we think it appropriate. We're most apt to do so when something happens that seems likely to materially affect results previously expected. We'll disseminate these projections widely and update them as needed in the affected period.

We will neither estimate our earnings nor comment on the estimates of others, though we may comment on the assumptions others have used in predicting our results if they differ markedly from our own. Except for such comments, however, our designated contacts won't confirm the accuracy of outside estimates either implicitly or explicitly.

Our schedule of quarterly earnings announcements is generally as follows:

First quarter—Annual Meeting, usually fourth Tuesday in April.  
Second quarter—July 20-25.  
Third quarter—October 20-25.  
Fourth quarter—February 5-10.

During the approximately three weeks before the announcement of each quarter's earnings, company contacts won't answer questions on specific units' performance, though they will answer those dealing with routine operational matters.

**Limits.** We'll try to answer your questions as fully and promptly as possible, but there are certain limits. We release earnings by product or service group only annually; we give only general information on the performance of separate divisions or plants. We review these limits periodically and change them as warranted or possible.

**Publications.** We routinely distribute the *Investor Fact Book*, Financial Bulletins, reprints of some speeches and other items of interest to security analysts. Shareholders may obtain copies of these documents from the manager of investor relations, Daniel Stepanek.

---

## Dial 800-621-5445 for Borg-Warner NEWS

For a quick news update on Borg-Warner, call 800-621-5445. In Illinois, call 312-322-8600.

This taped message will be changed on the first Friday of each month or more often if developments warrant.

Borg-Warner's main telephone number is 312-322-8500.





**Borg-Warner Corporation**  
200 South Michigan Avenue  
Chicago, Illinois 60604